

APPENDIX

— TO THE —

REPORT ON LEPROSY

— OF THE —

PRESIDENT

— OF THE —

BOARD OF HEALTH

— TO THE —

LEGISLATIVE ASSEMBLY OF 1886.

Hawaiian Islands. Board of Health

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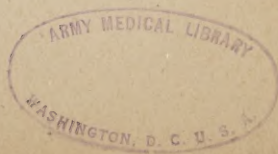


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APPENDIX A.

*Report of Her Majesty QUEEN KAPIOLANI's visit to Molokai, by
H. R. H. PRINCESS LILIUOKALANI, July, 1884.*

TO HIS MAJESTY THE KING:

SIR,—I have the honor to submit the particulars of Her Majesty's visit to the Leper Asylum on Molokai whom, in obedience to Your Majesty's wishes, I accompanied thither. The steamer *Waimanalo* having been placed at the disposal of Her Majesty by Hon. J. A. Cummins, the party embarked early on Saturday, the 19th of July, 1884, leaving Honolulu at 3 a. m. and arriving at Waimanalo at 8 a. m. that morning.

The weather proving favorable on Monday morning, we left that port for Kalaupapa, reaching our destination in the afternoon. At 4 p. m. the party consisting of Her Majesty the Queen, Hon. J. Cummins and lady, who were in attendance upon Her Majesty; Dr. Edward Arning, M. D., and Mr. C. B. Wilson, Comptroller to my household, landed and were received by Ambrose Hutchison, the Assistant Superintendent, Rev. Father Damien, and Rev. Father Albert, who escorted the party to a house where a large number of the patients were assembled.

The Hon. J. A. Cummins addressed the people and stated the object of the Queen's mission among them.

Her Majesty then arose and with the usual salutation of "Aloha Oukou," briefly addressed them as follows:

"With love I greet you all. My heart-felt sympathy and that of His Majesty the King, your Father, is with you in your affliction. The King has sent His Sister the Heir Apparent, to accompany me in this mission, to show his love to you. I also bring to you the love of the people of Honolulu, the ladies and gentlemen, natives and foreigners, and those of the other islands who have assisted me in raising the necessary funds and contributions for your relief.

"I have been made familiar with your letters to me, and petitions to the Legislature, and whatever remarks you may have to make we will be pleased to hear them while we are with you.

"The principal object of this mission to your Asylum is to know your condition, and to render such assistance as may be necessary for your comfort."

The people were much moved with the Queen's remarks. The assembly standing during the address. At the conclusion of Her Majesty's remarks, Kailikapu made the following address, "Your Majesty, Your Royal Highness, and gentlemen, I must, first, on behalf of my fellow sufferers, express to you our warm and heart-felt feeling and thanks for this exhibition of your tender love and affection towards us, your afflicted people. I have been an old inmate of this Asylum and this is the second time I have been removed from Honolulu to this place, where I suppose I must remain like my afflicted fellows to linger out a miserable existence without a hope of cure; away from the comforts of home and the society of family and friends. Since my last removal to this place, by a close observation of the workings of the disease here, I have become thoroughly convinced of the non-contagious nature of the workings of the disease here. Instances are numerous here where men afflicted with the disease have been accompanied by healthy wives, who have lived with them, and nursed them for years until death, without the wife becoming affected by the disease, or in the other case the husband. Children, too, have been born of diseased parents and reared among the lepers, without contracting the disease; several such cases are among us now. Such being the case I cannot see how the disease can be called contagious or why we are segregated in an isolated place, where our most urgent wants are but poorly supplied. Poor food, insufficient as regards quantity, and want of proper care and nursing, are prominent among the ills of which we have to complain, and if the Government cannot supply these as they are supplied to us when at home, they should return us whence we came.

"Our rations consist of 21 lbs. of paiai, 7 lbs. of beef, and 1 lb. of sugar per week. Of this 7 lbs. of beef, 5 are often made up of bone. This is sufficient for one person only for three days, and the remaining part of the week he has to go without food. Those living at Kalaupapa have to travel five miles to get their rations, and there being no means of conveyance supplied, such as are too feeble to travel that distance, and have neither horses of their own to travel on, or friends to assist them, are often deprived of food. Many poor, disabled people too are unable, in their feeble and

mutilated condition, to prepare their own food after they have got it. When the rainy season sets in the streams would be swollen, and these feeble ones would sometimes be so exhausted that they were unable to cross the stream on their way home, and therefore had to wait until the storm and freshet subsided before they were able to cross. From this cause many have taken cold, and died in consequence.;

"An order for six dollars' worth of clothing is allowed per year to each patient, which they get filled at the store of the Board of Health. This is altogether insufficient. One woolen shirt and a blanket is all it will buy. On account of being thus poorly supplied with clothing, some die of cold, especially in the winter months. One great need also is wholesome water to drink and use for preparing food. Now we have to go three miles for water and pack it ourselves, and very often we are compelled to use the brackish water from a well near the beach.

"I will also speak of another matter—that is of the healthy children amongst us. Why are such children (many of whom are well grown, and without any sign of the disease about them) allowed to remain here and become patients through contagion? Why are they not taken elsewhere and properly cared for?"

The second speaker, Mr. Kahanapule, said: "Greeting to you our Queen, and to your Royal Highness and gentlemen: By the request of the patients now residing at Kalaupapa and Kalawao, I was selected from among their number to draft a petition in their behalf to be presented to the Legislature, now in session, in which was made a statement of our needs and a prayer for relief—a duty I was glad to perform. The confidence they have placed in me to act in their behalf, I now avail myself of on this occasion to make known to you what I believe to be our sorest needs; I speak in the interest of these people you now see around you, and more especially of those in crippled condition, unable to be present to meet you upon this occasion, and of those who would have joined with us in showing our appreciation of the great love you have shown to us in the willingness with which you have crossed the dangerous ocean to meet us, and hear our appeals and relieve our necessities. Our needs are many. Foremost among them is the necessity of clothing, some one with authority to settle our difficulties, and satisfactorily dispose of them. At present we have to submit without appeal to the arbitrary ruling of the Agent of the Board of Health, and

are often incarcerated for alleged offences in a summary manner, and without a hearing of the case.

"It is the desire of many of us that a resident judge should be appointed, who will always be present to hear and determine in a proper manner many of the little grievances between the members of our colony, and also be empowered to punish justly any offence against the peace and good order of our community. Our general superintendent visits us only once during each quarter of the year, and remains altogether too short a time to make such investigations as are necessary to the end of justice. Especially frequent are desertions in married life, and the annoyance suffered on this account is great. Many; to-day, amongst us are living in adultery because they feel secure in their removal from the reach of the law. With the general Government I have no actual fault to find, as every endeavor is being made to provide for our numerous wants; but I do blame the Board of Health for its laxness in carrying out a proper system of supplying those wants which have been liberally provided for by the Government. Our paiai, for instance, is landed at Waikolu Gulch, about five miles distant from Kalaupapa, and the patients of that part are necessitated to pack it themselves all that distance. This is a grievous task to many, while to those who are weak it is an impossibility. The place of landing, too, is so situated, and the road to it impassable, that in stormy weather travel there becomes actually dangerous, and at times pack-horses, together with their burdens, have been washed away and drowned, and men too have barely escaped with their lives. In such an event, those to whom the food belongs are necessitated to go without their supply until a new lot has been received. After the paiai is obtained many of the more crippled are unable to prepare it themselves, and can have no water to mix it with unless they are willing to use the brackish water near the beach, which is entirely unfit for any such purpose.

Those who prefer it may, in lieu of paiai, have 9 lbs. of rice and 7 lbs. of hard bread per week. They are compelled to make the change when the poi supply is short, or when they are unable to go that long distance for paiai. But such food is not satisfying, even when we have eaten our fill with other kinds of food we were not satisfied. Poi is our natural food, and nothing could take its place. Kokuas who help the patients have to be fed out of their rations, and when this is the case the weekly supply of food is not more than sufficient

for three days, and the unfortunate one goes part of the time hungry. Many of the patients have kokuas to prepare their food for them, otherwise they would, and sometimes even do, die of starvation. What the previous speaker has said in regard to the insufficiency of warm clothing and the number of consequent deaths is perfectly true. If the Government intends to keep us here, let the Board of Health be instructed to exercise a better care over our wants. Each of us has an allowance of \$6 a year."

Mr. Ambrose Hutchison, who is Under-Superintendent of the entire Settlement, said: "Being myself an employee of the Board of Health, I feel it my duty to uphold the actions of the Board where they are defensible, but at the same time I feel it my duty to my fellow sufferers here that I should speak plainly of matters as they are. I concur in the statements made by the previous speakers with reference to the food supply, and the mode of delivery. Their statements are not exaggerated. For those who are so crippled as to be unable to attend to their own wants a hospital is provided; but their prejudices against the institution prevent many of them from availing themselves of the comfort there afforded. Their dread of the place may be easily explained, when we take into consideration the fact that it was formerly a practice to send along with each patient, by the same conveyance, the coffin he was soon to occupy. Add to these things the fact that no proper care or nursing is provided, and the horror of the place so generally entertained by the patients is easily explained. The great want here is the institution of more approved nursing facilities. The hospital patients should be also supplied with better accommodation generally, and be provided with a more appropriate place in which to take their meals. If to such provisions were added that of a resident physician and an efficient staff of nurses, the main source of objection would be removed, and then they might enter the hospital willingly instead of avoiding the place as they do now. Could some Sisters of Mercy be induced to come up and remain among us, as is now the case at Kakaako, it would certainly be a great blessing. The nursing is now performed by kokuas who receive no pay, and whose heart is not in their work, and amounts to nothing so long as they attend to the wants of their own people. They go and come as they please, and patients suffer much from their neglect. One thing I would like especially to call your Majesty's atten-

tion to, and that is among us are a number of children born of diseased parents, who themselves are entirely free from all symptoms of the disease."

Taking in his arms a little girl about ten years old from the crowd, the speaker said: "Here is one of them, and there are here between fifty and sixty just such cases as this, and at various ages. These should be kept aloof from the diseased, and properly cared for in a separate asylum, and not be allowed to remain where the chances are of so many of them becoming patients by contagion. I would urge upon the Queen and the Heir Apparent to have this matter attended to, and to allow the weight of their elevated positions and the great influence they possess to bear upon the Board of Health, in order to bring about the realization of so worthy an object. In conclusion, I can only express my hope that this royal visit may be pregnant of future good, and may prove the harbinger of an improved moral and social condition among us."

Two other speakers followed in substantially the same strain as the two first speakers; one of them, a young man of the age of thirty years, spoke at length upon the proposition for the appointment of a resident judge, and told a piteous tale of the infidelity of his own wife, and his want of means of redress. He had no other complaints to make against the Board of Health. What was done for them was perfectly satisfactory, and they were all well provided for. A murmur of disapproval was at once raised, and interfered with the continuation of his remarks.

After making such visits as time would allow among the tenements of Kalaupapa, Her Majesty and company proceeded on horseback to the main settlement, arriving at about 7:30 o'clock p. m. There quarters were provided for the Royal Party by Mr. Van Geisen in a new house lately built for the special accommodation of visiting physicians. At supper the Rev. Father Damien was a guest.

After breakfasting on the morning of the 22d, the party consisting of Her Majesty, attended by Hon. J. A. Cummins, Dr. Arning, Mr. C. B. Wilson, Mr. J. H. Van Geisen, and the under-superintendent Mr. Ambrose Hutchison began to inspect the houses of the patients.

In the first place visited there were nine patients, one of which was a very bad case. He had been twelve years at the settlement and nine in the Hospital; his age being about

60 years. Three were about the age of 30 years, and the remainder boys between 15 and 7 years of age.

To questions put by Her Majesty, they complained that their bedding, (only mats,) was too hard, their covering insufficient to keep them warm at night, and their food was neither properly prepared nor always sufficient in quantity. They complained also of neglect at the hands of the kokuas, to whom were detailed the work of administering their medicine and dressing their sores.

They also expressed their desire for the attendance of a resident physician who could prescribe for them in the many cases of inter-current diseases, such as bowel complaints and other troubles which were frequent among them. When questioned as to the conduct of the visiting physician, they said that his visits were so short, and his work so hurried that no practical advantage was to be derived from them.

In the second ward were ten patients ranging in age from 25 years to 70. Most of these cases seemed to be of the anæsthetic form of the disease, there being but comparatively little distortion of features. In the majority of these cases fingers and toes were either entirely wanting or in process of amputation, rendering the victims almost entirely dependent upon the help of others. Some had bound up their own ulcerated extremities themselves after a primitive fashion. To the question asked whether or not such ulceration could be healed, by appropriate treatment, Doctor Arning answered in the affirmative, qualifying the treatment, however, by saying that in some cases the healed surfaces might again take on ulcerative action, that being the natural tendency of the disease. These patients uttered the same complaint as those previously visited; but complained especially of the neglect of the kokuas and the difficulty they often experienced of getting a sufficiency of water regularly supplied them notwithstanding the fact that there was an abundance of water on the premises.

The third ward contained eleven patients, five of whom were 60 and 70 years old, three about 35 years of age, and the remainder between 17 years and 20. One aged 25 years had totally lost his sight, and all his fingers and toes. This result of the disease required him to be fed by another patient of the ward. Among those was the old man Nakahuna, well known to all old residents of Honolulu as a vendor of Hawaiian curios there a few years since. He has had the

disease about four years, and has been an inmate of the Hospital at Kalawao for three years.

Worthy of remark is the case of a woman named Kealahua, whom we met in this ward. She came to the settlement about 14 years since with her leper husband, who died there about seven years ago of the disease. She herself is robust and to all appearance without any symptoms of the disease about her, and is engaged by the Board to do the entire washing for the patients at the Hospital, at a salary of \$10 per month. She has been the mother of four children, one of whom died of acute disease without having developed leprosy, another of leprosy, the remaining two now living lepers.

The fourth ward contained ten patients, all of whom were women. Of these eight were between 19 and 30 years of age, and two about 65 years. Among them was a young girl of about 10 years who had accompanied her leper grandmother there. This, after a careful examination by Doctor Arning, was pronounced to be free of leprosy symptoms, and her removal recommended. The great complaint here seemed to be of the insufficiency of warm clothing and comfortable bedding.

The fifth ward contains two rooms, in one of which were six young men between 16 and 20 years, all of whom were inveterate cases. In the other room were two native boys and two chinamen. One of the boys was threatened with blindness from the disease. Insufficiency of warm clothing was also their complaint.

The sixth ward was occupied by one patient only, who was in the last stage of the disease. He was horribly deformed in features and his eyes totally blind. He seemed to be undergoing intense suffering and was muttering, throwing himself about in the wildest manner. Doctor Arning was called in and gave him a draught which seemed to give speedy relief; and at the end of half an hour he was sleeping quietly. Such cases as this prove the value a resident physician might often be.

In the seventh ward were four very bad cases. One in particular was noticed, where, though the face showed little disfigurement, the whole trunk was a mass of inflamed or suppurated tubercles which emitted an offensive smell unbearable to stand. In noticing this patient the Doctor observed that with proper medical treatment, such cases as

these might be greatly alleviated and a great deal of unnecessary suffering be prevented.

In the eighth ward were three boys, between the ages of 14 and 17 years, all bad cases. They seemed diffident and had no complaints and nothing otherwise to say.

The Lock-up was next visited. The building is about 10 by 15 feet in dimension, and contains two rooms about 6 feet long and 9 feet wide respectively. These are poorly ventilated by small iron gratings situated on the leeward side of the building. In one were two chinamen, both sentenced to one month's confinement on a charge of assault with a deadly weapon upon one of their countrymen. In the other was confined a native, named Makahui, sentenced for burglary in the store of the Board of Health, and abstracting therefrom money to the amount of about \$240, his partner in the crime one Naai by name, had terminated his own life shortly after sentence, by suspending himself from the gratings of his cell.

The cooking arrangements are commodious, cleanly kept, and convenient; a cooking range being supplied sufficiently large to do the cooking for 150 persons. The poi room is also spacious and clean.

As numerous descriptions of the settlement generally, and of the Hospital in particular, have heretofore been published, it will be unnecessary to give a further description. But here I may say that great credit is due to those in charge for the very neat and cleanly manner in which everything connected with the premises is kept.

After leaving the Hospital premises, the party next visited the store-house, situated not far distant from the Hospital and immediately across the road. Upon a close observation of the stores, all the articles provided appeared good, with the exception of the sugar, bread and salmon, the last mentioned article being so mouldy and soft as to be unfit for use; the sugar dark and dirty, of about No. 3 or No. 4 quality; and the bread tolerably good for medium bread, though inferior to that supplied to the Oahu Jail.

There are about 14 head of cattle butchered per week. Allowing (which according to the statement of some butchers is a large average) that each bullock weighed dressed, 350 lbs., and seven pounds per week of beef to an individual, the amount of beef slaughtered would supply only about 700 people; whereas, there are at the settlement, including the kokuas, a population averaging between 850 and 950 souls.

The arrangements for slaughtering are most primitive; and

the water supply insufficient for the cleansing of the meat. Arrangements, however, are now being made, whereby this defect will soon be remedied. A new reservoir is now in process of construction near to the place of slaughtering and designed to be filled from pipes connecting with the valley supply.

The next subject which engaged the attention of the party was an inspection of schools under the charge of the Rev. Father Damien. The buildings occupied for this purpose are supplied by the Board of Health, one of which is used for a boys' school and the other for girls, being situated in near proximity, and on the opposite sides of the roads. Both are within the vicinity of the mission church.

In the girls' school are sixteen pupils in all, ranging in age from 9 to 17 years. Among these was the young girl Luahiwa, of whom mention was made by Dr. Fitch in his late Biennial Report. Of all these scholars she bore the worst marks of disease. Out of these children there were four between 9 and 11 years of age who exhibited no external signs of the disease; but one, upon careful inspection by Dr. Arning, was declared to be in the incipient stage of disease.

In the boys' school were twenty-six pupils, all of whom were well marked with the disease.

The pupils of each school are separately lodged and fed. They are all either orphans or friendless, and are under the immediate care of Father Damien and a native woman named Kuilia, not herself a leper.

After leaving the school the party proceeded on horseback for the purpose of inspecting the old and the newly proposed sources of the water supply of the Settlement. The system now in use, and which has been so almost since the establishment of the Settlement, has its source in the valley of Wai-aleia. It is now recognized by the Board as inadequate to the needs of the place, and a proposition has been made to bring the water from Waikolu Valley—about two miles further on. Waikolu is the place where the paiai supply of the Settlement is landed and dealt out to the patients, being about three and a half miles from Kalawao, and five and a half from Kalaupapa. After traveling the road to this valley one is forcibly struck with the force of the universal objections made by the patients of the great distance they have to travel for their food.

The water supply here is abundant and never-failing, and capable of supplying the needs of a town larger than Hono-

lulu. The scenery of this valley is grand. The numerous cascades darting out in all directions from over the lofty precipices, the spray gracefully falling among the dense shrubbery and covering the green foliage as with gems of pearls. A sight seldom seen or surpassed in magnificence and beauty.

In the valley are several acres of land now lying idle which might be utilized, at a small outlay, in the cultivation of taro and other products for the use of the Settlement. The landing of two boat-loads of paiai during the sojourn of the party there afforded an opportunity of realizing the fact that a number of complaints, already enumerated, were not without foundation. The stream was so swollen by the rains which had been unceasing during our visit that, after a difficult landing had been effected, it was still more hazardous for the animals with their heavy packs, and they had to be forced to cross over the stream.

After staying in the valley for half an hour the party took the opportunity of inspecting a proposed new landing about half a mile from the Hospital, thence returning to Kalawao and visiting on the way every house to be seen. Most noted among the houses visited were the dwelling of Kaulamealani, Napua, Kuanea and Kii. The two last named individuals were pitiable objects indeed, and entirely dependent upon the friendly assistance of their neighbors for what help they received. Their fingers and toes were almost entirely gone with the disease. With suppurated hands and stumpy fingers they had improvised rude bandages for relief. Hospital accommodations and aid were clearly needed, but in reply to the question put to them, they said that they had a horror of entering the Hospital.

Her Majesty, as well as others of the party, was much affected at the touching sight of these two old women, utterly unable to help themselves, and promised every exertion on her part toward the removal of any objection that might really exist in the institution, and that efforts hereafter should be used to render the place attractive and not repulsive. As there was little time to spare, and as Her Majesty had promised to address the people of Kalawao before leaving, she bade the sufferers a kind adieu, and the company wended their way toward the settlement, arriving at the store where the address was to be given at three o'clock that afternoon. A large number of patients had gathered. Her Majesty proceeded to address them similarly as upon the previous occa-

sion at Kalaupapa. At the conclusion of her address, she was heartily cheered by the people. A few among them responded to Her Majesty's remarks, but as they were of similar tenor to those previously given, it will be unnecessary to quote them here. Upon our final parting, three cheers were given for their Majesties the King and Queen.

Before leaving the house at Kalawao, the party engaged itself in planting several seeds of alligator pears and mangoes, taken from a large supply of such fruit seeds as had been brought by Her Majesty for distribution among the people.

The landing was finally reached at about half-past seven o'clock p. m., after Her Majesty had made a slight detour in order to visit an extinct crater whose basin is partially filled with sea water by a subterranean connection with the ocean. Before leaving the place, however, Her Majesty again visited every tenement in the neighborhood. Incidentally I would mention an interview which took place at the landing between one of the party and Kelikapu, one of the former speakers, several others being in the company. This man claims to have contracted the disease from vaccination, it having appeared about four years after. He asserted that through the same agency all of his schoolmates had died of the disease. In speaking of other matters, he said, that a great deal of bad management existed, rendering a loss to the Government of about one-third of the cattle driven to slaughter over the precipitous road from Kalae, and thought it would be far less expensive on this account to land them from vessels at Kalaupapa. He said there was ample pasture in the district for several hundreds of cattle.

He disapproved of the appointment of a resident judge, saying that such an office was unnecessary, and that such an idea had only originated in the brain of one who was looking forward to his own appointment. A foreigner, he said, would never suit as under-superintendent of the settlement, as, owing to prejudice, his actions would often be misjudged, and trouble of a serious nature might ensue. Natives would be more likely to overlook or condone the fault of one of their own race, than would be the case if the offender were a foreigner. He said that the present overseer Mr. Hutchison was in every respect a good man for the position and universally esteemed in the settlement. He thought there was urgent need of more Hospital accommodation, and medical attendance and nursing. He said that not the least among their difficulties, was that of obtaining wood for fuel. As it

was now the patients had to travel far and climb the mountain themselves to get it.

Upon a careful review of all the facts elicited by our visit and observation of the existing state of affairs, the following propositions have suggested themselves:

1st. As the supply of water is manifestly inadequate to the needs of the population, it would be advisable to put into operation the proposed plan for bringing the water from the valley of Waikolu, where an abundant and never failing source could be obtained, and the supply so created should also be extended to Kalaupapa, where brackish and unwholesome water is now only obtainable. Here the water is often rendered absolutely unfit for use by an overflow of the tide into the well from which the supply is derived.

2d. A resident physician and an assistant is needed, whose dwelling place should be in near proximity to the Hospital, that being a central locality. The patients die in many cases from other maladies, such as diarrhœa, dysentery and other complaints that can be treated, if proper medical aid were at hand.

3d. The Hospital accommodation should be increased so that at least two hundred patients could be admitted.

4th. If possible, Sisters of Mercy should be induced to lend their aid in carrying out the nursing part and care of the Hospital.

5th. There should be an ambulance provided for the transportation of crippled patients, also two spring wagons for the more convenient delivery of beef and paiai to the lepers, at or near their dwellings.

6th. It would be good to subsidise a small steamer, from 80 to 100 tons, able to carry 20 to 30 head of cattle, 50 cords fire wood and the poi. This steamer should also be used for the transportation of patients from Honolulu to Kalawao.

7th. Lepers who are unable to help themselves, should be compelled to take shelter in the Hospital.

8th. For the treatment of children in the incipient stage of the disease, with a view to their cure, and also as an Asylum for the otherwise healthy children where they could be kept apart for a reasonable time, there should be two proper buildings provided in or near Honolulu, to be attended by a competent physician and an efficient nursing staff.

9th. As so much complaint is made about an insufficiency

of food and clothing, it might be advisable to increase the supply of the same, and to have the rations altered as follows:

- 4 lbs. of beef delivered twice a week,
- 15 " paiai delivered twice a week,
- 1 " salmon (for variety sake,) per week,
- 4 " mutton occasionally, in place of beef,
- 2 " sugar not darker than No. 2,
- 5 " salt per month.

I would suggest also a trial of canned meats, such as are put up in Australia for army and navy use, by way of variety as a substitute for beef, it might be found useful and economical.

1 bar 2 lbs. soap per month.

$\frac{1}{2}$ gallon illuminating oil per week.

In regard to clothing, it would be advisable to supply each person with a certain amount for day and night wear, in place of an allowance in money for that purpose, as at present. Many misuse their money, and suffer in consequence. It would be far better to allow each person two suits of woolen clothes a year and two blankets, the same as is done at the Oahu Jail.

There is no reason why a moderately large herd of beef cattle and milch cows could not be raised on the pasture lands of the settlement. The beef cattle could be kept for cases of emergency, when weather might interfere with the regular supply and the cows might be milked, more especially for the benefit of children and the sick.

In the two valleys of Waikolu and Waileia, there is much land uncultivated which would be suitable for the growth of taro, if it could only be utilized, which I believe is possible, if proper inducements were offered to cultivators.

It would be advisable that Waikolu should be abandoned as a place of landing, on account of the dangerous nature of the only road thereto; and that a boat landing be constructed near Kalawao. Such a plan is perfectly practicable and could be perfected with but little outlay. The road to the present landing place is for two miles of its length over lava rock, and overhung by craggy precipices from which frequent showers of stones are precipitated upon the road below, rendering travel dangerous to man and beast. A greater danger still exists in the frequent washing out of the road by the sea, making it on this account, in stormy weather, highly unsafe to travel.

There should be a better system adopted in regard to the kokuas than at present exists. So far as efficiency and reliability are concerned, the present plan of giving the work of the place to kokuas is a failure. It is not to be expected of persons going there as they do, merely to serve their own immediate friends or relations, that gratuitous work could be voluntarily performed by them for others, and any compulsion in this matter is altogether out of the question; and yet it is upon their general help that reliance has under the present system is to be mainly placed.

The support of every kokua means so much less in the way of food, rations and other necessities to every patient that needs their help, and the question of propriety in allowing so many healthy people to place themselves without restriction in the way of contagion, is one to be taken into consideration.

In closing these suggestions, I cannot help stating that the settlement as an asylum for these poor unfortunate creatures is decidedly the best place for them for a place of strict isolation and the condition of things are much better than that at my former visit in 1881.

The party slept on board the steamer which lay at anchor that night, and at 4:45 a. m. on the morning of the following day, left Kalaupapa for Honolulu, arriving at the wharf at 12 o'clock m., after a smooth and pleasant passage across the channel.

LILIUOKALANI.

APPENDIX E.

Report of DR. G. L. FITCH, 1884.

To the Honorable the President and Members of the Board
of Health:

GENTLEMEN,—In this my Quarterly Report as Medical Officer in charge of the Leper Settlement, for the quarter ending Sept. 30th, 1884, I propose to thoroughly discuss the question of the contagious or non-contagious nature of Leprosy and its etiology.

Before expressing any opinion of my own, it will be proper to give the views held by others, who have made the study of the disease elsewhere, and so I quote as follows from the "Report on Leprosy by the Royal College of Physicians."

"The Committee having carefully considered the replies already received are of opinion that the weight and value of the evidence they furnish is very greatly in favor of the non-contagiousness of Leprosy.

"The Committee can only repeat the statement made in their former report to the College, that the replies already received contained no evidence which in their opinion justified any measure for the compulsory segregation of lepers."

Acting on the advices already obtained, the Duke of Newcastle forthwith issued a circular to the Governors of the Colonies expressing his opinion "that any laws affecting the personal liberty of lepers ought to be repealed, and that in the meantime if they shall not be repealed, any action of the executive government in enforcement of them, which is merely authorized and not subjoined by the law ought to cease."—*Hand-book of Treatment—Aitken.*

Doctors Danielssen and Boeck state, "that among the hundreds of lepers whom we have seen daily, not a single instance has occurred of the disease spreading by contagion. We know many married persons, one of whom is leprous, cohabiting for years without the other becoming affected. At St. George's Hospital many of the attendants of the inmates have lived there for more than thirty years and are quite free from any trace of the disease. * * * As the result of our observations we

have only to deny the contagiousness of leprosy."—*Coll. Phys. Report, p. 4, XIX.*

JAMAICA—

"I am certain that it is in no way contagious and that it is not transmissible by sexual intercourse. The evidence against the contagion of leprosy in all its forms is IRREFRAGABLE."—*Dr. Fiddes.*

BARBADOES—

"I have not met with any cases of contagion, none of those in attendance during the last nine years upon the inmates of the lazaretto have contracted the disease and I, after receiving a wound from a knife, moistened with the fluids of an inmate, have escaped, although the wound was followed by great constitutional irritation and loss of the finger. From what I have heard I do not believe it communicable by sexual intercourse."—*Dr. Broune.*

MYTILENE—

"It is demonstrably not contagious. Dr. Bargilli practised inoculation in two instances, but without results."

CRETE—

"There are 127 persons who have all lived together healthy among lepers for many years.—*Dr. Brunelli.*

MAURITIUS—

"Never did I know two instances where medical men have wounded themselves in dissection but without any bad results."—*Dr. Powell.*

BENAVEO—

"All the reporters agree in stating that leprosy is not contagious, nor transmissible by sexual intercourse."—*Dr. Dunbar.*

NAGPORE—

"During the nine years I have held charge of the Nagpore goal, with the daily average of 500 prisoners, all of whom freely intermingled, and some of whom when imprisoned were lepers, I have never known an instance of contagion. * * * As far as I could ascertain the disease does not seem transmissible by sexual intercourse."—*Dr. Hendes.*

NEW BRUNSWICK—*Coll. Phys. Report, pps. XLIII, XLIV, XLV.*

"I am thoroughly convinced that the disease in Tracadie is not contagious, and that it is not transmissible by sexual intercourse. All the cases I have reported prove its non-contagiousness. Leprous husbands have lived many years with their

wives, and *vice versa*, without infecting each other. Children have been born of leprous mothers, and have been nursed and handled by patients in the Lazaretto in all stages of the disease, without manifesting any symptoms of the disease.”—*Dr. Bayard*.

“It does not seem to be transmissible by sexual intercourse.”—*Dr. Gordon*.

“I have never met with an instance of leprosy being communicated to a healthy person by contagion. On the contrary we have a female, who, for the last six years has scrubbed the floors of the hospital, washed their clothes, ate, drank and slept with those affected, and who, notwithstanding, exhibits no trace of malady, and at present enjoys good health.

“Leprous husbands have, for many years, slept with their wives and families, and wives with their husbands, without contracting it. Children have been born of leprous mothers in the last stages of the disease and have been nursed by lepers, and have now attained adult ages without manifesting any symptoms of the disease. All of which proves it not to be transmissible by sexual intercourse.”—*Dr. Nicholson*.

“Several lepers have cohabited with their wives for years and no infection was communicated to them. In the case of a leprous man now in the hospital, the wife has continued free, although two of seven children which she has borne to him are afflicted with the disease.”—*Dr. Benson, Coll. Phys. Report, p. 4*.

William Aitken, M. D., etc., etc., says in his recently issued “Handbook of Treatment,” p. 238, A. D. 1882:

“LEPROSY; TRUE DEFINITION.

“A constitutional non-contagious hereditary affection. * * There appears no more need (or just about the same) for restricting the liberty of lepers as for restricting the liberty of those afflicted with the gout.”

Under the heading

“A CASE OF INDIGENOUS LEPROSY,”

in the Medical Record of August 16th, 1884, W. H. Greddings, M. D., of Aiken, South Carolina, U. S. A., says: “Isolated cases of leprosy have been observed in Charleston and its vicinity for many years, the present being the latest of a series of twenty, that have been brought to my notice during the last twenty-five years. * * * In none of these cases was the disease hereditary, although in one instance a mother and daughter were affected at the same time. In all these cases except the one just mentioned there was not the slightest evidence of contagion, nor has it ever been deemed necessary to isolate

those affected with the disease. When well enough they walked about the streets of the city, attracting but little attention, as the people know from experience that in this country they run no risk of contracting the disease by coming in contact with those affected with it

"As isolated cases of leprosy have been observed on the coast of South Carolina, for nearly forty years, without any apparent increase in the number of cases, it may be safely inferred that there is but little danger that the disease will ever become endemic in this section."

A. Balmanno Squire, M. D., of London, says: "Greek Elephantiasis was formerly thought to be contagious. It has, however, long been satisfactorily ascertained that it is not so."—*Reynold's System of Medicine*, Vol. 3, p. 948, A. D. 1880.

Thomas Hawkes Tanner, M. D., F. L. S., of London, says: "*Elephantiasis Græcorum*, or *Elephantiasis Anæsthetica*, or the *Eastern Leprosy*, is a terrible and dangerous constitutional disease, being endemic and affecting the poor and badly nourished in preference to the well fed, while it is non-contagious, hereditary and generally incurable."—*Practice of Medicines*, Tanner, p. 671.

"That leprosy in Japan is not in the slightest degree contagious or infectious; that the idea to isolate lepers from other patients does not occur to anybody. In my own wards I have always had lepers between other patients, everybody knowing the nature of the disease, but no one objects to the sleeping in the bed next to theirs. No disinfection is ever used. There is a native Doctor in Tokio, in whose family the treatment of leprosy has been carried on as a specialty for at least three generations, he and his whole family live in the same house with his leper patients. For a hundred years, many, many thousands have been treated in that very same house in the center of the capital inhabited by more than a million of people and never one case of contagion has happened."—*Dr. Baelz, Prof. of Chemical Medicine at the University of Tokio, Japan*, (on board the steamer *City of Tokio*, Pacific Ocean, September, 1884.)

Dr. Baelz is one of the best and most favorably known physicians of the Orient. The above quotation is an extract of a letter from Dr. Baelz to Rev. S. C. Damon.

A recent visitor at the Lazaretto in Tracadie found the Mother Superior of the Sisters of Charity, who have charge of the Lazaretto, with her hands in the same basin of water with those of a leper, whose hands were covered with leprous ulcers. She, the Mother Superior, was cleansing the ulcers preparatory to dressing them. There are nine Sisters of Charity at that Lazaretto who have lived there for fifteen years, engaged as nurses

and caring for lepers; none of the Sisters have contracted the disease.

My authority for this statement is Rev. Father Lenor, Provençal of the Catholic Mission in these Islands. (Verbal communication.)

The following quotation is from a recent newspaper article which, from other sources of information, (on the Etiology of Leprosy, by G. Armaner Hansen, Assistant Physician to the Leper Hospital at Bergen, Norway,) I believe to be a true statement:

"In a report given a few days ago by the head physician of Norway, for the cure of leprosy, it is shown that by the end of 1856 there were known in Norway 2,863 cases of leprosy, of whom then but 235 were treated in hospitals, and 2,628 in their houses. Since then there has been steadily more isolation, and thereby a steady diminishing of new cases, so that by the end of 1866 there were 2,704 cases, and of these 795 were in hospitals, and 1,909 in their houses; a decrease of 159 cases. By the end of 1876 there were 2,008 cases, showing a decrease of 696 cases.

"Since the decrease has been regular; thus there were known, in 1877, 1,923 cases; in 1878, 1,853 cases; in 1880, 1,582 cases; of whom 617 were in hospitals, and 965 in their houses. Thus the decrease of this disease is from 2,863 cases in 1856 to 1,582 in 1880; in all 1,281, or 45 per cent."—*Hawaiian Gazette*, March 10th, 1883.

Summing up this statement it will be seen that, beginning with 1856, we find one case in twelve, or a little over, segregated, and 2,628 different foci of contagion—according to those who believe in contagion—engaged in spreading the disease, and yet the disease begins to decrease, so that with a gradually increasing number of cases segregated—or rather varying in number, for in 1866 seven hundred and ninety-five were segregated, and in 1880 only six hundred and seventeen,—by 1880 45 per cent. of the disease disappears, but still about three-fifths of the cases are at large. It has been asserted, however, that those who were living in their homes were carefully segregated.

Drs. Danielssen and Boeck say: "In Norway most of the cases of leprosy occur among the very poorest classes of the inhabitants, and especially among those living around the shores of the deep bays or fiords on the West Coast. The huts of the people generally are of one low narrow room, in which all the family live, with a small window that is not made to open, are usually planted down in a damp site, and surrounded by filth." *Coll. Phys. Report*, pp. LXVII.

How to make these facts agree with the assertion of the advocates of contagion in Hawaii, who so eagerly assure us that all

the cases here originated from one imported case—a Chinaman, many years ago—and that the disease has all spread from that one case, is a matter entirely beyond my comprehension. As we shall see further on, there is no evidence in favor of such a statement whatever.

As is well seen, the evidence of observers in other lands, who have been brought into intimate contact with the disease, and have really investigated the matter, seems generally opposed to the doctrine of contagion. These like Dr. J. C. White, of Harvard University, who has seen one case—(*Am. Journal Med. Sciences*, p. 447, 1882—or Dr. J. R. Tryon, of the U. S. Navy, who, during a visit of some week's duration here in Honolulu, visited the Kakaako Leper Hospital three times—and in the *American Journal Med. Sciences*, April, 1883, is very sure of the contagious nature of the disease; and various observers elsewhere, who have examined the disease at a secure distance, are equally certain of it; but real, practical, earnest workers in the field, like Drs. Danielssen and Boeck of Norway, with their forty or more years of experience, say: "Among the hundreds of lepers whom we have seen daily, not a single instance has occurred of the disease spreading by contagion." * * *

"As the result of our observations we have only to deny the contagiousness of leprosy."

And now let us turn to what we can find here in Hawaii to help us form a conclusion on the subject.

In the March number, A. D. 1883, of the "Medical Bulletin," published in Philadelphia, I find this statement by J. V. Shoemaker, A. M., M. D.:

"I am indebted to Professor Samuel D. Gross for a recent opportunity of seeing and examining a young man suffering from leprosy. The patient was sent from Honolulu to Professor Gross by Drs. Hagan and Trousseau, gentlemen who are well known in the Sandwich Islands as expert practitioners of medicine.

"The letter of introduction, and the description of the patient's condition, stated that they believed the case in question to be one of leprosy; and, as they regarded it non-contagious, they advised a trip to the States for a change and benefit to his general health, and wished him at the same time to have the best medical advice that this country could give."

That Drs. Hagan and Trousseau did, at that time, believe that leprosy was non-contagious *must* have been the case, for it is entirely inconceivable that any man, and certainly any medical man, would send a person suffering with a disease that they believed contagious, to infect a healthy community; yet how to reconcile this matter with the statement in the following card,

published in the *Hawaiian Gazette*, under date of May the 23d, same year, is beyond my ability.

“DOCTOR MATHES ENDORSED.”

“*Editor Gazette*:—We have read with pleasure the article of Dr. G. L. Mathes in the *Saturday Press* of May 15th, in which he ably sets forth the difference between syphilis and leprosy, and in which he gives the views of the great pathologists and eminent medical investigators of the present day.

“We cheerfully express our high appreciation of the article, and fully endorse the writer’s views in regard to the non-identity of the two diseases. Moreover, with a knowledge of the introduction and spread of leprosy among the people of these Islands, we believe the disease to be eminently contagious.

“As to cure, we regret to say, that nothing is yet satisfactorily established, although modern scientific investigation in different countries is tending to establish greater hopes in that direction.

“Such being the case, we recognize segregation as the only means left us to rid the country of the disease. While we realize the severity of such a measure, and do most heartily regret the necessity of its enforcement we cannot but feel that it is the only thing left us.

“Better to amputate a diseased limb, than through a false sense of tenderness to allow it to remain and gangrene the whole body.”

“G. TROUSSEAU, M. D.

“J. S. MCGREW, M. D.

“J. BRODIE, M. D.

“N. B. EMERSON, M. D.

“M. HAGAN, M. D.”

Cases of foreigners who have been on terms of close intimacy with lepers, for several years here, have come under my own observation, as follows:

EXAMPLE 1. A young white man A, over thirteen years ago, began illicit relations with a married native woman. Fifteen months passed, during which time he visited the woman two or three times a week, and then he discovered the woman was an advanced case of leprosy. He left her for three months, greatly frightened, then thinking that if any damage could result to himself, it must be already past remedy, he went back to the woman, whose husband had by this time forsaken her, and slept in the same bed with her, for eighteen months longer, when the woman was arrested by the police and sent to the leper settlement, where she shortly after died with the disease.

A has been living with another woman, non-leprous, for the last ten years and he shows no sign of leprosy.

EXAMPLE 2. A book-keeper in a house here, B, began illicit relations with a young native girl nearly six years ago. Two years later she developed leprosy, and after about two years more had passed she was removed by the police to the Kakaako Leper Hospital here. B is hemiplegic as I believe from syphilis, but is not a leper.

EXAMPLE 3. C, another white man, married a native girl over twelve years ago, after one month of married life they separated and did not meet again for seven years; when C picked her up on the street one night, not knowing her, and spent the night with her, and as he expressed it to me, was much disgusted in the morning to find he had spent the night with his lawful wife. Shortly before the meeting of the Legislature of this year, one of the white members who had picked up the wife of C, took her to a physician and was at once informed she was a leper, and inquiry revealed the fact that she had been so before she married C. I do not know positively how long the woman had cohabited with her lover, but believe it to have been a considerable period. Nearly three years ago she had procured a divorce from C, and in 1882 C married for his second wife another leper woman; she died March 31st, present year, and before two months C married his third leprous wife, with whom he now lives at the leper settlement, but he is not a leper, on the contrary he is a remarkably vigorous man of 45 years of age. For over two and a half years C has eaten the food cooked and prepared by lepers, his washing being done by a leper woman, and most of the time he has eaten at the table with an average of four cases of leprosy.

EXAMPLE 4. A planter, D, on one of the other islands took a young married native woman away from her husband more than eight years ago, she was a leper at the time, and D lived with her for seven years, then brought her to me a most disgusting creature. She shortly after died in Kakaako. D is a fine healthy looking man and shows no sign of leprosy.

EXAMPLE 5. An aged white man on Maui has fifteen children born of his native wife. Fourteen of the children are alive and well, and so is he except for the infirmities of age and drink. His wife has been a leper for the last ten years. They continue to live together.

EXAMPLE 6. A white man E, formerly a Captain of a schooner, married his native wife ten years ago. For the last six years his wife has been a leper, and I saw her two years ago, when there were leprous ulcers on her arms nearly as large as the palm of my hand. He assured me at the time that he was co-

habiting with her as usual. She is now a resident at Kakaako. He is a non-leper.

EXAMPLE 7. F, a native of Guam, married a native woman here six years ago, for four years she has been a leper. He is not. They still live together.

EXAMPLE 8. G, a Hindu, had a son by his native wife, now 29 years old. His wife had been a leper for about five years when she was sent to the leper settlement in 1873. G is not a leper.

EXAMPLE 9. H had led a most licentious life, he and his wife were both born here of white parents. At 42 years of age, after thirty-six hours of intense headache he became hemiplegic, left side; he avers that at no time was he unconscious during his attack. He has five children by his wife. The first a girl, in July, 1882, had a thin, weazened expression of countenance, was a great sufferer from long continued headaches; had marked swelling of post cervical chain of glands, and also both epitrochlears. The second child, before arriving at eight years of age, began to lose the use of left hand. When I saw the case, at the same time as the first child, the patient was 16 years old. Marked swelling of post cervical and epitrochlear glands as in the elder child. Hand withered away until it was no larger than the hand of a child of six years; and was anæsthetic and analgesic. Over the left pectoral region was an oval white patch surrounded by a bronzed areola analgesic in the white portion. Over the thigh was another of the same spots, each of these places were about three inches in their longest diameter. There could be no doubt that this was a well marked case of leprosy. The next child, younger, had only slight swelling of the glands, and the younger ones were apparently healthy. The leprous child was and has been going to school, and no distinction and no segregation had been made with this child any more than with any of the other children. But this alone was a leper of the entire family although they had had eight years to contract it in from this child if it were contagious.

EXAMPLE 10. I, a Portuguese, came a few days ago and begged me to let his native wife out of Kakaako and he would take her home and take care of her. She had been a leper for four years during which time they had cohabited as man and wife. She is one of the worst tubercular cases of leprosy in Kakaako, but I is a burly powerful man showing no signs of the disease.

EXAMPLE 11. J, another Portuguese, has had six children by his half-caste wife. She had been a leper for two years, her husband was drowned, a short time ago. J was not a leper.

EXAMPLE 12. K, another Portuguese on King street, has a

leprous native wife in Kakaako. She has been a leper for two years. K is a healthy man.

EXAMPLE 13. L, son of a merchant, deceased, took his leprous leman over to the island of Lanai nine years ago, and lived there with her for a year, when she was arrested and sent to the Settlement, and now L is married to a clean woman, and neither he nor his wife or children are lepers.

EXAMPLE 14. M, a native of Guam, became a leper seven years ago; four years ago his native wife died with typhoid fever, a non-leper; she had one child by him, who is now six years old, a non-leper. Shortly after his native wife died he married a Portuguese woman, a widow, who had one child by her first husband, and by her leprous husband she has had two. M is the only leper of the family.

EXAMPLE 15. N, the leper whom Drs. Hagan and Trousseau sent to Philadelphia. (Quoting again from the *Medical Bulletin*;) "Eight years ago, having felt poorly for a time, he noticed a dead spot of skin just above the knee. It spread slowly, and was only just about twice as large four years after its first appearance. Six months later he married a healthy native woman, and a weak puny child was born to them within a year, which lived only a short time." Wife is a non-leper.

EXAMPLE 16. O, the captain of a vessel here, died five years ago insane, a non-leper, although he was the father of two children by a leprous woman, Annie Aiwa by name. After O died, Annie married a man by the name of Mahiki, by whom she has had three children; the children by both men are all dead, none living to be more than three months old. Mahiki is non-leprous, although fully two years ago I saw Annie's back and limbs one mass of leprous ulcers, which afterwards healed up. Her last child by Mahiki died in September this year, aged six weeks. Annie has been a leper she says for about fourteen years.

EXAMPLE 17. P, a painter here, has been married to a native woman who is a leper for four and one-half years. P is not a leper.

This list embraces every instance where foreigners, exclusive of Chinese, have lived with lepers which I have seen personally. I have heard of a large number of other cases, and the result is the same. Not a single instance of contagion, or the development of the disease has occurred among these cases, or in any of the cases that I have only heard of and not seen, among those who have been known to cohabit with lepers, except those which are doubtful. A white leper at the settlement said he had had a multitude of native mistresses, and probably some of them may have been lepers. Another white man at the settlement said he had a native wife many years ago who had red spots on her, and

large sores. This may or may not have been leprosy. Counting these two lepers just mentioned, I have had nineteen white people under my care who had leprosy. I have carefully questioned all but two of them as to whether they had lived or been on terms of intimacy with lepers; all except the two whom I did not question, and the two whose statements I have already given, denied any relations with lepers, and most of them deny ever seeing a case until they were declared lepers themselves. The two whom I did not question were these: An aged Portuguese, with whom I could not converse, through inability to understand each other's language, and the first case I saw, which was shortly after I arrived in the Kingdom, and before my attention was called to this matter. Of course, the entire nineteen may have been exposed many times to the disease; for I doubt much if one out of fifty among all the physicians of the world would recognize the first case of leprosy they should see, unless it was a pronounced case. It is frequently a difficult matter to decide positively whether a person is a leper or not. There have been several cases here lately in which physicians, thoroughly familiar with the disease, were unable to agree, or come to a definite conclusion.

Turning back to instances, on June 24th, A. D., 1882, while engaged in making a post mortem examination of a boy who had died with leprosy the day previous, I scratched my wrist on my sleeve button and did not discover the wound until it had been covered with blood from the boy's body for a full half hour. I have never experienced the slightest bodily inconvenience from the wound. Some months ago, I regret I cannot give the exact date, Dr. E. Arning inoculated his finger while making a post mortem examination of a leprous cadaver. I called his attention to a scratch on his finger, just as he was about to begin the operation, but he took no precautions, and as a consequence, his arm shortly afterwards swelled clear to his body, and he suffered severe constitutional disturbance, but he has not developed leprosy.

Turning now to native cases. Kauulei, a mail carrier on Molokai, had the palmer surface of the third finger of his left hand bitten out by a leper six years ago. He is not a leper.

Geo. Naea, the husband of Queen Dowager Emma's mother, was a leper, as early as 1845, and died in 1854 with leprosy. His wife survived him until October, 1880, and then died a non-leper. In 1845, also a man by the name of Honolulu, became a leper and died with the disease about 1862. His wife Mele now lives at Moanalua a non-leper. The first case of leprosy as far as I can find out which attracted public attention here was a man by the name of Ahia. He was a hulumanu or member of

the body guard of Kamehameha III. His case was well known as early as 1840. He died with leprosy in 1856. His wife died in 1860 a non-leper. A woman by the name of Lilia now lives at the leper settlement, she went there with her husband, a leper, in 1870. He died and Lilia married leper number two. He died and Lilia married leper number three, with whom she now lives. Her son by her first husband has developed leprosy, but Lilia is a fine looking healthy woman. Kalehua, a woman, went with her husband, a leper, to the settlement in 1868. He died, and Kalehua, in addition to living a most licentious life with the inmates of the hospital, lepers in the last stages of the disease, is also the hospital laundress, having done the washing of the blood and pus saturated garments of the inmates for upwards of ten years, but she is a remarkably fine looking healthy woman, showing no trace of the disease. Kua, saddler and shoemaker at the settlement, was this month married to a leprous woman. He has married three leprous consorts, the first having been a leper over sixteen years ago. He is not a leper, but has been a severe sufferer from syphilis since I have had charge of the settlement.

In 1860, Nahuaae, male, died with leprosy. His widow, Mele by name, at once began illicit relations with a man by the name of Kalalau. At the end of three years he forsook Mele and married a sister of Nahuaae, Holomakini by name. Holomakini tells me that while Kalalau was living with Mele, he contracted sores on his penis, from her presumably, and after a time his eyebrows fell out, and in 1868 he was declared a leper, and sent to the settlement, his wife going with him. After a time he died and Holomakini married a man at the settlement, who was not a leper, and he died with some dropsical affection. Then Holomakini chose for her third husband John Lui, a leper, and he died with the disease in March, present year. Holomakini is non-leprous, but has been a severe sufferer from syphilis contracted as she avers from her first husband Kalalau.

Now turning back to Mele, after Kalalau forsook her, she consoled herself by leading a promiscuously licentious life for several years, but finally settled on a man by the name of Kamai, who tells me that he had syphilis years ago. In 1878 he was sent to the settlement a leper; shortly after his arrival there he picked up a woman. Kaahumanu by name, with whom he still lives. She is a non-leper.

Once more turning back in our history to Mele, after Kamai was sent away, she married a man by the name of Oalamahia. He said he had syphilis before he married Mele. In 1883 he followed Kamai to the settlement, and now Mele is living with a white man on Hawaii. She had children by Nahunui, but

they all died, none by Kalalau, two by Kamai, both dead, and two by Oalamahia, both living. So Mele conceives by three lepers and buries her first leprous consort twenty-four years ago, but she is not a leper.

In 1838, Kamuli, a woman, went from Kilae, Hawaii, to Koloa, Kauai, and returned in 1841 to Hawaii a leper. None of the rest of her family developed leprosy, and a number of them are still in the same land where she lived and died a leper.

Naihi, a boy aged ten, had, three years ago, a large leprous ulcer on his cheek and another on his upper lip. His finger and toe nails were dropping off, and the ends of his toes were raw sores. One day I found him lying with the ulcer on his cheek in contact with the bare arm of his foster mother, both of them covered up with a blanket so that no part of them was exposed. The blanket being over their heads, of course the mother must have been breathing the same air several times over that the leper boy had expired as well as the emanations of the leprous ulcers. Yet she is not a leper to this day.

In 1857, Mikona, a native, married Caroline Green, a half caste. Mikona was a leper when they married. Four children were born to them. The first two, as they arrived at the age of puberty, became lepers, the third is now a man grown and the father of a family; he is not a leper. The fourth child developed leprosy at about six years of age. Mikona and his three leper children are buried at the leper settlement. Before he went to the settlement his wife Caroline had a lover to whom she was granting her favors, his name is Kamaiopili. After Mikona was sent away Kamaiopili and Caroline inter-married. As a fruit of their union, there are three children; one boy, and two girls. Neither of these children, Kamaiopili, or Carrie are lepers.

Yet Caroline married a leper thirty years ago, lived with him sixteen years, had four children by him, three of whom developed leprosy; and now has three children by another man, who, if report (which she does not contradict, as I heard her talking on the subject) be true, was cohabiting with her, turn and turn about with her husband, and yet Carrie, this man, and their children escaped.

In fact, I might continue this narrative giving date, place and circumstance of hundreds of cases that I have collected, but I will continue the evidence in another form.

It is a well-known fact that leprosy exists in a large percentage of the native race. Estimating the entire native population of pure blood at something over 40,000 and total number of lepers at 1,800 would give us four and a half per cent. at any one time. I base this estimate on the fact that on Oct. 9th,

there were 723 lepers at Kalawao settlement and 180 at Kakaako leper hospital, and from information from different portions of the kingdom, in answer to inquiries I have made.

Drs. Danielssen and Boeck state, "That the average duration of the tubercular form among the patients in the hospital at Bergen, from 1840 to 1847, was between nine and ten years, and of the anæsthetic form, among the same, was between 18 and 19 years.—*Coll. Phys. Rep. p. LXV.*"

Sept. 30th, 1884, we had at Kakaako hospital 67 married males and 36 married females, that is where either sex were, or had been, married. One married couple were in the hospital, and of the rest, three of the males had had leprous wives, and one woman a leprous husband.

No larger number of persons became lepers from inter-marriage with lepers, than in the community at large, as these figures plainly show.

Presenting the evidence in another form. The Leper Settlement at Kalawao was inaugurated A. D. 1866. Since which time up to the 1st of April this year, 2,864 persons have been consigned there as lepers. Oct. 9th I made a careful census of the number of the children alive who were born at the settlement, and where either or both parents were lepers before the birth of the child.

The total number was twenty-six, as follows :

MALES.

<i>Name.</i>	<i>Age.</i>	<i>Parents.</i>
Kalani.....	8 years.....	Mother Leper
Mahai, (is a leper).....	14 years.....	Father Leper
Keoloewa (brother of Mahai).....	11 years.....	Father Leper
Kukelaile.....	4 years.....	Mother Leper
Kalaniuli.....	2 years.....	Both Lepers
Samuela.....	21 months.....	Mother Leper
Joe Kanaana.....	4 years.....	Both Lepers
Kunihi.....	3 years.....	Father Leper
Kahema.....	2 months.....	Mother Leper
Keoni.....	9 years.....	Father Leper
Damiana.....	9 years.....	Mother Leper
Keahimu.....	9 years.....	Both Lepers
Opupeli.....	10 years.....	Father Leper
Joe.....	8 years.....	Both Lepers
Total, 14 boys.		

FEMALES.

Keneki.....	2 years.....	Mother Leper
Kahua.....	8 years.....	Mother Leper

<i>Name.</i>	<i>Age.</i>	<i>Parent.</i>
Kamaka.....	4 years.....	Both Lepers
Likapeka.....	1 year.....	Father Leper
Lilia.....	13 years.....	Father Leper
Abikaila.....	9 yrs	Sisters of Mahai and Keoloewa.
Elikapeka.....	7 yrs	
Keohō.....	3 years.....	Both Lepers
Hoomanawanui.....	11 years.....	Both Lepers
Kalua.....	10½ years.....	Both Lepers
Leialoha (This girl is a leper).....	9 years.....	Both Lepers
Mary.....	3 years.....	Mother Leper
Total, 12 girls.		

Of the total number it will be seen that fourteen are above the age of six years, or at or above the age when the permanent teeth begin to empt, the earliest period of life when I have seen a case of leprosy developed, and before which I do not believe it ever appears, at least it must be seldom, as I have not seen a case younger among over two thousand lepers who have been under my charge.

Two of the fourteen only are lepers, although in addition to being born of leper parents, they have lived in the houses of lepers all their lives.

In 1866 the easterly side of the point of land projecting out into the sea from the base of the cliff, on the northern side of Molokai, was duly set apart for a residence for persons afflicted with leprosy; and the disease having been by law declared contagious, all lepers were required to remove, or be removed, to this settlement.

In 1873 the westerly side of the promontory was annexed to the settlement, but there remained several kuleanas, or homesteads, which were not purchased by the Government, and the owners of these kuleanas remain on their lands to this day.

With a number, at least, of these kamaainas, or owners, it has the custom to take lepers into their families to reside, so as to share the rations of food provided by the Government for the sick; and, where this has not been the custom, they have freely commingled with their leprous neighbors, and, in two instances, have inter-married with lepers.

The total number originally of these kamaainas were thirty-eight. One of them developed leprosy before the place was annexed to the settlement, but none of the rest have become so since the annexation, a period of eleven years.

Now let us proceed to sum up the evidence.

First—The Royal College of Physicians, a body of medical men representing the highest medical intelligence of the age,

deny the contagious nature of the disease, after a study of it lasting through a period of several years.

Second—Acting on the advice of this body of medical men, the Secretary of State for the English Colonies instructs the Governors of the Colonies, “that any laws affecting the personal liberty of lepers ought to be repealed; and that, in the meantime, if they shall not be repealed, any action of the Executive Government in the enforcement of them, which is merely authorized, and not enjoined by the law, ought to cease.”

The results of such action, if the disease was contagious, would seem most certainly to be a vast increase of the malady. Let us see whether this be so or not.

In the *Chronicle* of the London Missionary Society, March, 1884, I find the following, by Rev. James Kennedy, M. A.: “Lepers are found in all parts of India, not in such numbers as to be an appreciable portion of the population, but in such numbers as to be well known. They are regarded by the Hindoos as objects of divine displeasure, not on account of wickedness in the present life, but on account of wickedness committed by them in a former birth. While thus regarded they are not excluded from society, as was the case with the Jews, and is still the rule in some parts of the world. They are allowed to move about, and to ask alms of those they meet. At Benares, I have sometimes seen them sitting on a native bedstead with persons who, if they did not touch them, showed at least no dread of their immediate neighborhood.” * * * “While Kumaun was under native rule lepers were buried alive, their nearest relatives heaping earth on them, but since the establishment of British rule, in 1815, this atrocious custom, as well as other customs equally inhuman, has been suppressed.” P. 89.

Rev. J. H. Bruce, of Satara, India, writes: “I cannot find that there are any government laws whatever on the subject of leprosy. There are certainly no laws of segregation, and lepers are found everywhere in their own homes and villages. There are no restrictions in regard to their marriage,—there could hardly be any in this land of *infant* marriages. In the case of adults, the non-leprous party would shrink from marrying a leper. When, however, one of the parties became a leper after marriage, there would not always, and perhaps not generally, be a separation of husband and wife. * * * We have had in our house for years a child nurse, who is the widow of a leper. * * * You ask how Vishompunt could preach and visit if he were a leper? The fact of his being a leper was well known, and never in any way concealed, yet he continued his pastoral work until within a week of his death.” Letter to Rev. C. M. Hyde, D.D., published in *Hawaiian Gazette* May 14th, 1884.

"I find from the censuses of the following Provinces of 1871 and 1872, comprising nearly the whole of India, viz., Bengal, Madras, Bombay, the Central Provinces, the Northwest Provinces, Oudh, Coorg and Mysore, that the total number of lepers then enumerated was 99,639, or 1 in 1,864 of the population; but, as I have already stated, about 1 in 1,500, or 120,000 would be, I believe, nearer the truth."—p. 42, "Leprosy." W. Munro, M. D., C. M. Manchester, 1879.

Third—Segregation, except in so far as it prevents hereditary transmission of the disease, has absolutely no effect towards checking it.

A. In India, under native rule up to 1815 lepers were buried alive but still the disease persisted while under English rule with no compulsory segregation we find at the most, only one in 1500 persons a leper.

B. In Norway it begins to decrease with only one in twelve and a fraction segregated, and by the time two in five are segregated, 45 per cent. of the disease has disappeared in the short space of twenty-five years.

C. In South Carolina the disease does not increase in forty years without segregation.

D. In Hawaii, where a larger percentage of cases are segregated, than Norway the disease for many years increased. Although at no time within the last fifty years have less than one half the cases of leprosy in this kingdom been segregated, and for the last two years a still larger proportion.

E. Heredity plays but little figure in the spread of the disease, because we find that after sending more than 2,800 lepers during a period of eighteen years to Kalawao Leper Settlement there are only twenty-six children alive and only two of these children are lepers.

While, however, this disease is as I believe absolutely non-contagious, that fact does not do away, as far as these Islands are concerned, with the need of strict segregation. Let loose the 903 cases who are now segregated, and remove the laws of segregation, and before a month, life here to any person of ordinary sensibility would be nearly unendurable. The rotten festering loathsome persons of a host of lepers would undoubtedly be seen on every street and highway. For these people seem utterly incapable of understanding, or feeling, why they should not exhibit themselves in all their repulsiveness anywhere and everywhere.

The disease is seen altogether more of, at large and in public, now than is pleasant, and if the law of segregation were to be abolished, I for one would very quickly seek some other locality for a residence. But carrying out the law to the letter presents

almost insuperable obstacles, which no one who has not been in a position to know from personal experience can fully comprehend. The separation of wife and husband, parents from children, and sending them away forever is a horrible responsibility while the scenes witnessed at such partings are heart-rending.

Fourth—Leprosy is an absolutely non-contagious and non-communicable disease FROM A LEPER to any other person by any possible combination of circumstances, except by heredity.

a. We find that seven incubations, namely, the two cases inoculated by Dr. Bargillo, the two cases mentioned by Dr. Powell of medical men wounded in dissecting leprous cadavers, Dr. E. Arning, and myself, wounded in the same way, and also Dr. Browne, who lost his finger as the result of inoculation, and no leprosy results. These seven cases mentioned do not, as is seen, include Kauuku the mail carrier on Molokai, who had his finger badly bitten by a leper.

b. Husbands who have leprous wives, and wives who have leprous husbands as is seen in the 103 cases of married persons at Kakaako Hospital, do not contract the disease in a larger proportion of cases than among the community at large.

c. Women conceive and bear children by leprous husbands, and in some cases, first by a leper, and the children also develop leprosy and yet the wife and mother escape, and, as found afterwards, capable of bearing healthy children by a healthy man.

d. Food cooked by lepers and eaten by non-lepers; the clothing of non-lepers washed by lepers, and the blood and pus saturated garments of lepers laundried by non-lepers, eating, sleeping, drinking with lepers for years fails to reproduce it.

Fifth—Those who are constantly exposed to the disease for years as physicians, nurses and attendants on lepers seem to invariably escape, certainly the proportion is not larger if as large as among the population of countries where leprosy is endemic. In fact I can find only one case in medical history where a physician contracted it and no nurses are mentioned as having it.

For years it has been the custom here among those advocating contagion to offer what to them seemed apparently an unanswerable argument in favor of contagion.

"Thirty or more years ago, there were only a few cases here, and now there are hundreds, it must have spread from contagion. there is no other way to account for it."

In A. D. 1856, when I first went to a mining camp in California, malarial troubles were a thing unknown, but in less than ten years "fever and ague" was as common, or more so there,

than leprosy is here now. Yet no one thought of contagion, although not unfrequently one after another would be taken down with the disease in the same place.

Very frequently a man would be taken sick with the disease, and shortly after the wife, or *vice versa*, which, according to some acute observers who write on leprosy, is a sure proof of contagion, but probably these people would not observe any sign of contagion under the same circumstances with malarial disease; but I am utterly unable to see why it is not as much a sign of contagion in one case as in the other.

As I have before stated, nineteen foreigners, exclusive of Chinese, have come under my care, having the disease, during the four year's residence in the Kingdom.

All these persons, with one exception, were adult males, with no history in any instance of hereditary taint.

How have these parties contracted the disease?

This brings up the question of Etiology.

GEO. L. FITCH, M. D.

APPENDIX I.

REPORT BY DR. EDWARD ARNING.

HONOLULU, H. I., November 14th, 1885.

To His Excellency W. M. GIBSON,

President, and Members of the Board of Health.

SIRS:—At the request of the President of the Board, I furnish you with a report as to the course of investigation, carried on by me with regard to Leprosy.

The general headings, under which the work is being conducted, may be classified thus:

- I.—Clinical.
- II.—Morbidity—Anatomical.
- III.—Special Bacterial Research.
- IV.—Therapeutic.
- V.—Hygienic.

All these different classes of work have had an even amount of attention bestowed on them, which I will try to outline in the following, without of course going into details, which have found, and will find, their place in medical publications.

I.—The *clinical work* embraces: Inquiry into the general historical features of the disease, and into the history of the disease in the individual. I have here encountered great difficulties, and am afraid have wasted time and patience in trying to derive reliable information from the Hawaiians. Lack of observation of their personal health and wilful deceit are so mingled with truth in their statements, that I defy anybody to collect reliable statistics, such on which it might be possible to base proofs for hereditary or congenital transmission of Leprosy on these Islands. Of course, I do not deny that good anamneses

may be obtained in some cases, but to base theories on this kind of evidence alone must assuredly lead to fallacy.

The second part of the clinical work pertains to the symptoms of Leprosy, as we find them on these Islands, and their similarity, or dissimilarity, to the symptoms described in the accounts of observers at other times, and in other localities. The practical drift of this comparative symptomology, as I may term it, is perhaps, not quite obvious, although none the less important. All endemic and epidemic diseases are apt to modify their character and appearance with time and circumstance. General experience goes to show that milder forms follow the more malignant type, and may be welcomed as indications that the disease has reached its acme. Certainly this applies more strictly to epidemics of acute character, but, due allowance being given for time, it holds good also for the chronic infectious type of disease.

Now, there seems to me to be no doubt that a great number of cases are to be found on these islands which present, and often have presented for years, one or two symptoms of leprosy, mostly belonging to the group of leprous nerve lesions. I style these cases *abortive leprosy*, and I venture to hope that they may be hailed as signs of a decrease of virulence of the disease in general. I have bestowed particular attention on the symptoms of these initial and abortive cases, as the diagnosis of leprosy is, of course, a terribly severe one, and more liable to be disputed in these cases than in the advanced stages. Full notes have been taken of all these cases, and will be of importance in a number of years hence, when I shall try to gain new information about them, and see whether the leprous virus was only dormant in them, or actually exhausted. Of the value of these cases for therapeutic action, I shall have to say more hereafter.

A great number of lepers was examined as to the presence or absence of the *Bacillus Lepre*. The results I summarize as follows:

1. The *Bacillus* is found plentifully in all nodules of the tubercular cases, and likewise in the diffused swellings of the skin in the tubercular cases.

2. It is found in similar quantity in the nodules and diffused infiltrations of the mucous membranes of the mouth, throat, nose, rectum and large intestine.

3. In case of softening and breaking down of these nodules, the bacillus is mixed with the discharge in great quantities. The presence of sores in the mouth, throat, and nose causes large numbers of bacilli to be contained in the saliva and the mucous discharge from the nose. In leprous diarrhoea which closely simulates dysentery, but which I have been able to trace to lep-

rous, not dysenteric ulcerations of the bowels, I have been able to detect the bacillus in the fæces.

4. In the so-called anæsthetic cases, the bacillus is not found in the anæsthetic patches, nor in the chronic sores of necrotic parts of skin, tissue, and bone; but as nerve excisions have proved to me, in the nerves supplying these mutilated parts with vitality.

5. The bacillus cannot be found in the bright red patches, so frequently ushering in the first formidable attack of the disease and mostly occurring on the face. These patches are always located in the distribution of some larger nerve and are seats of local vasomotoric congestion, based on leprous disease of this nerve.

6. The bacillus cannot be found in the urine of lepers, which is accredited by the Chinese to be the infection-carrier "par excellence."

7. The bacillus as such cannot be found in the blood, not even during the febrile attacks marking the progress of the disease. As it has of late been asserted by different observers that the blood contains the germ, particular care has been bestowed on this point. Their statement must be due to the fact that in obtaining a drop of blood for examination, the bacilli have got into the blood by not carefully selecting a healthy spot of the skin in pricking for blood, but going through diseased tissue and getting some of the bacilli contained in this tissue mixed with the blood.

For all that, the germ may be contained in the blood, more especially during the febrile attacks, possibly in some hitherto unknown, but suspected form of spore-condition, a stage of the life of a bacillus. These suspected spores may not be visible either on account of their minuteness or which is more likely on account of our inability to make them visible by the staining methods we use in searching for bacteria.

As this is a most important point for the whole question of the spread of the germ, I have applied myself most assiduously to its investigation by devising new staining methods and employing the highest magnifying powers at our command, also by culture experiments with blood taken from lepers during their febrile attacks, with the idea of making the spores which I consider it likely to contain, grow into fully developed bacilli, and become visible as such.

At present I must confine myself to the statement that the blood of lepers, if taken with all due precautions, does not contain the bacillus.

8. It has been noted before by Danielssen and Boeck, the Norwegian observers, that leprous ulcerations of the nose occur

in anæsthetic cases, which otherwise present no ulcerations. I have met with this peculiar condition in two cases. One that of a Portuguese who had brought the disease with him from the Azores, and the other that of a young Hawaiian girl. These cases being otherwise not very advanced, and decidedly not repulsive looking, were discharged from the Branch Hospital. But I must consider these cases a great deal more dangerous than their general appearance would lead to believe. I was surprised to find in both cases the discharge from the nasal sores full of the bacillus.

Next to this microscopical work in relation to the clinical aspect of leprosy, my attention was directed to the peculiar features of *leprous anæsthesia and paralysis*. They have been examined under the heads of distribution, intensity, and mode of progress, and as to their spinal or peripheral origin. For these particulars we have to rely mainly on the modern teachings of electrodiagnosis. Let it suffice to say here, that I consider all these troubles due to leprous disease of peripheral nerves, and that I believe the distinctions found in this respect between leprosy and the great number of other diseases of the nerves, spinal chord and brain, will enable us to pronounce with more confidence on the nature of what it is here customary to call suspicious cases.

The different appearances of *muscular wasting and contraction* have been studied in comparison to similar symptoms of other neurotic diseases. The advanced, or I may say, completed stage of this muscular derangement is not so very far different from similar troubles due to other nervous lesions, such as rheumatic, diphtheritic, traumatic, etc., whereas the beginning presents more salient features, which will with due regard to accompanying symptoms enable us to specify the particular disease as leprous or not.

But this muscular crippling being largely due to mechanical causes, is decidedly not as characteristic as the *bone disease* of leprous origin. The mode of attack, the privileged seats of caries and necrosis, and the resulting crippling, are decidedly one of the most peculiar features of leprosy, and most strikingly different from bone disease, due to osteomyelitis, syphilis and tuberculosis. As such, they claim a particular share of our attention, more than they have hitherto found.

A large number of photographs and plaster casts have been taken of cases, selected at Kakaako and the Molokai Settlement, to substantiate these experiences, and to serve as illustrations for future publications:

A certain amount of attention and study has, furthermore, been accorded to *diseases of more external nature*, presenting any

resemblance to leprous lesions, and occurring both independently and in company with leprosy. As such, I mention *pigmentary and parasitic skin diseases*. A very troublesome affliction of this nature, unknown to the Hawaiians, has been introduced by the Gilbert Islanders, among whom it is quite common. I have seen a pure Hawaiian, who is married to a Gilbert Island woman, suffering with it. He had been subject to it for years, and was looked upon by some as a suspicious case of leprosy, but I have since been able to cure him entirely with simple applications of chrysophanic acid. The true scabies, or itch, due to the insect "*Sarcoptes Hominis*," is exceedingly prevalent at Molokai, and will be hard to eradicate there under existing conditions, just as we are not able to eradicate it in large cities. I have successfully stamped out a small epidemic of it at Kakaako, and great watchfulness will be further needed. Only quite recently a hideous looking case of tubercular leprosy, in a 7-year old boy, was brought to the Branch Hospital. A great part of his hideousness was due to inveterate itch, and this trouble caused him a great deal more pain and discomfiture than his leprosy. It was, of course, easily cured, and had to be done so at once on account of its eminent contagiousness.

In the foregoing I have attempted to outline the clinical part of my work. In case the Board desires it, I will condense the results into the form of a schedule, which may serve as a guide for examination of doubtful cases.

II.—*Morbid—Anatomical Work*. Here I can confine myself to closer limits. I have been able to make 17 post-mortems of lepers, which have given me much valuable opportunity to study the anatomy of the disease, and have enabled me to make some important discoveries regarding the diffusion of leprosy through the internal organs. For this reason I deeply deplore that lack of support by the Board has put a stop to this most intrinsic part of my work since last Spring.

In all advanced tubercular cases, I was struck with the extreme frequency of grave changes in the larger viscera, more especially the lungs, liver, spleen, and bowels. These organs presented an aspect quite new to me, and closer examination of their tissues has enabled me to prove that we have been mistaken in attributing deaths of lepers to inter-current pneumonia, tubercular phthisis and dysentery, which were simulated by the clinical symptoms. The ulcerations of the bowels and the breaking down of lung-tissue are due to leprous infiltrations, and we shall have to modify our opinions of leprosy, being mainly a disease of the cutis and peripheral nerves and introduce terms such as *phthisis leprosa* and *enteritis leprosa*, etc.

As far as the brain or spinal chord were examined, I found

them unaffected, but they will yet have to find a very close and searching microscopical scrutiny. This applies generally to all the material collected from the post-mortems and preserved in different ways.

III.—The *bacterial research*, i. e., the question of etiology of leprosy, is another most essential part of my investigation, and at the same time the most subtle and delicate. No one who has not tried himself at this particular kind of modern research is able to judge of its many disappointments, its dependency from apparently insignificant particulars, and the difficulties which crowd upon you when you are working outside of the accustomed laboratory with its always handy intelligent help and never-failing supply of requisites.

The line of experiments embraces :

1. Search for the germ of leprosy in the air, water, and food.
2. Attempts to breed it outside of the living organism on artificial soils, employing the greatest variety of composition of soil and different grades of constant temperature.

Of soils I have used :

1. Koch's meat-peptone-gelatines of varying strengths.
2. Gelatines made of seaweed and meat.
3. Gelatines made of seaweed and fish.
4. Bouillons of meat and fish.
5. Sterilized and solidified serum of blood taken direct from the carotid artery of bullocks and sheep.
6. Vegetables, solid and in decoctions.
7. Poi.

After being sterilized, i. e., freed by high temperature, (steam and dry heat.) from any germs they may accidentally contain, these soils are implanted, in sterilized containers with the leprosy germ and kept for weeks together at constant temperature in the incubator, and carefully watched day by day.

Until now, the results of this work are altogether negative. Under all the varied conditions, I have not once succeeded in obtaining an independent and pure growth of the *bacillus leprosy*.

Parallel with these culture experiments, or artificial soils, a large number of experiments were conducted to grow the germ in living tissue. For this purpose I have procured and inoculated a variety of animals at ages ranging from a few days old to grown up beasts, rabbits, guinea-pigs, rats, hogs, pigeons, and a monkey. They were inoculated in and under the skin, in the cavity of the abdomen, under the conjunctiva of the eye, in the anterior chamber of the eye, and in the ulnar nerve, mostly with small pieces of leprosy tubercle excised under anti-septic precautions.

I have been able to follow up, microscopically, the presence

of the *bacillus lepræ* at the spot of inoculation for months after the introduction, but have not in a single instance been able to observe any general symptom of leprosy.

The negative results of all this work are not valueless and discouraging. On the contrary they act as a stimulus for further research. I am not in the habit of drawing hasty conclusions, especially from negative evidence, but as from well proven analogy with kindred diseases we know that the *bacillus lepræ* is the etiological factor of the malady, and as we find it impossible to discover, or grow this bacillus outside of the human body, but find it in immense numbers and rapidly increasing in the human body, we are naturally driven to the following conclusions:

1.—The *bacillus lepræ* is a parasite limited to the human race.

2.—It must be transmitted either directly from individual to individual, or—

3.—Run through a stage of intermediate life (spore condition), which we are at present unable to detect, for reasons given above (on page 39 of this report), but which may be present in the soil, water or food, but can only get into them from the diseased tissues of a leper.

4.—Accepting either theory, the direct or indirect transmission, we must look upon every individual leper, whether in the incipient or advanced stage of the disease, as a dangerous focus of the malady, he multiplying and nursing the germ in his tissues.

5.—As every seed requires its peculiar conditions of soil, atmosphere, etc., to allow it to strike, and, when struck, to grow up to be itself a seed-bearing plant, so does the leprous germ require a certain disposition of the human soil to strike and thrive. What this peculiar disposition may be, we are at present unable to define. It is evidently a disposition which may co-exist with apparent good health, as many examples of strong robust men, developing leprosy, show us. This disposition may possibly be transmitted by heredity. I desire not to be misunderstood on this particular point. I do not believe that leprosy itself is in any case congenital; but I do believe that a certain weakness to resist its attacks may be transmitted.

I have hinted at similar ideas in the motives accompanying my application to His Majesty's Privy Council, to be allowed to perform some inoculation—*experiments on the condemned convict Keanu*. The application I made resulted in the sentence of death, passed on the murderer, being commuted to penal servitude for life. With the prisoner's written permission, I commenced operations on the last day of September, 1884, after hav-

ing previously made a most searching inquiry as to any leprous taint in his family, and a close examination of his own body. This examination satisfied me that, as far as I am able to judge, no trace of the disease could be found in him at the time. A further step was to insure that the prisoner would not be employed at work outside of the prison walls.

As stated above, I inoculated Keanu on the 30th day of September, 1884, and, for the four weeks following, I saw him daily, and after that once a week for several months, a microscopic examination of the inoculation spot being made every time. After that period the convict has been examined by me regularly, once or twice a month. The microscope revealed the presence of the *bacillus lepra* in large numbers until the middle of March, 1885. They have since gradually diminished in number, but a recent excision of a small part of the scar shows them present even yet, i. e., nearly 14 months after the inoculation.

At the same time there is nothing in the general appearance of the convict which would denote any development of leprosy. Pains in the joints of the inoculated arm, from which Keanu suffered in January and February last, have since disappeared.

To the foregoing I wish to add the following remarks:

1.—I do not consider my experiment with Keanu concluded, or mature for scientific publication.

2.—Even if future observation should show us no trace of leprosy developing, we would not be able to infer more from the experiment than that in this case inoculation proved ineffectual.

3.—I have given this account of the experiment to Your Excellency, and the members of the Board, to allow you to judge of the spirit in which it is being conducted.

4.—Moreover, I have been induced to do so by recent perfectly unauthorized publications of Dr. Fitch, in a California Medical Journal, as a protest against the thoroughly unprofessional conduct with which this author, who could only gain knowledge of my doings in an underhand manner, has brought my name and work forward in support of his own unproven assertions.

I take the same opportunity to protest against the narrow arguments used by the same author, as far as this subject of inoculation goes. He cites my name, and an ordinary post mortem blood poisoning which I acquired at the autopsy of a leper as a proof of the non-possibility of inoculation of leprosy. It would be a very bad thing, indeed, if all the cases of common, local, or general septic poisoning, at a post-mortem should result, in our acquiring the disease the patient was subject to.

Vague statements of this nature do not deserve, and would

not find an answer from me in a scientific publication, but as they are put forward with the intention of captivating the mind of the general public, and are as bold and positive assertions more apt to do so than the often restricted and guarded utterances of calm independent observation, I have given them this brief consideration in my report.

Closely allied to the inoculation question is the subject of vaccination. You are doubtlessly aware of the very prevalent opinion among medical men, that the unusually rapid spread of the disease may possibly be attributed to the great amount of indiscriminate vaccination which has been carried on in these islands. There have, if my information is correct, unquestionably new centres of leprosy developed after vaccination was practiced and several old inhabitants have told me, how they themselves used no precautions whatever in vaccinating during a small-pox scare, but brought the lymph directly from one arm to another, without even wiping either points or lancet.

To bring some light on this moot point, I vaccinated a number of lepers. The vaccination only took in three cases, one tubercular and two anæsthetic. Both the lymph and crust of the tubercular case contained the *bacillus lepræ*; in the anæsthetic cases, I could not detect it. As the vaccinations are now conducted by medical men and with bovine virus, it may seem to be perfectly superfluous to dwell any further on this point, it apparently presenting only historical interest. But recent experience causes me to advise the Board not only to supply its medical officers with animal vaccine and points, but also to issue strict regulations as to the manner how this virus is to be used. If the lancet is dipped into the virus, then into the arm, then again into the virus and the next arm, or if points used for one vaccination are re-coated for further use, as physicians of the other islands have, at my special inquiry, owned to do, then the use of bovine virus gives us no safe-guard whatever against the propagation of constitutional disease by vaccination. The main point is the thorough disinfection of the lancet after making one vaccination, and before dipping it into the lymph for the next arm. This is easily obtained by heating the point of the lancet in a spirit flame to a dull red heat, and it forms a main part of the instructions issued to the Government physicians in Germany.

Another point which has been raised is the possibility of the leprous virus being conveyed by mosquitos. I am at present occupied with investigating this subject. The endemic elephantiasis of the tropics, a disease which is happily unknown here, has lately been traced to propagation by mosquitos, and by these solely.

IV.—The next of my headings is that relating to *therapeutics*. As this is one of the practical sides of the question, and one in which the general public naturally takes the greatest interest, as it considers it more within its scope than the rather distant etiological and pathological studies relating to leprosy, I beg to be permitted to begin with some general remarks on this subject.

All our therapeutic action may be classed either as *specific* or *symptomatic*. Looking upon disease as a weed, which grows in the fertile soil of the body, we may say that with the former, we aim to strike at the root of the weed, whilst with the latter we only lop its branches and keep its growth in check.

There are very few diseases where we can rely entirely on specific treatment, the most notable being syphilis, malaria and acute rheumatic fever. For these three diseases we possess in mercury and iodine, quinine and salicylic acid respectively, real specific medicines; and if by their aid we have been able to restore a patient suffering from either of these troubles, we may say he has been cured by these medicines. On the other hand we have a vast number of diseases where we have to rely on symptomatic treatment, i. e., mainly alleviate pain, ward off external danger and keep up the power of the body, so that it may rally to healthy reaction and cast off the disease by its own efforts. This applies to all our acute zymotic diseases, the eruptive fevers, small-pox, scarlatina, measles, etc., to the various typhus fevers, to cholera, dysentery, etc., and very nearly to all chronic diseases, foremost to consumption, the scourge of our age, *and as yet to leprosy*.

We have no specific for leprosy, nor has any man of any other country or nationality. Scientific medical information reaches too far now-a-days to permit of any agent of this kind being known by an individual and kept as a secret. Anything put forward in that way without being published through the regular channels must be regarded as quackery and nothing else.

Anybody who is read on the subject of leprosy, in fact, any remoter medical literature will be struck with the amount of attention bestowed on the therapeutic portion in those writings. The tendency of our age is to simplify therapeutic action as much as possible, and not experiment empirically, but bring therapeutics within the rational limits of physiology, etiology and pathology. There is scarcely a drug in the pharmacopœa, at least scarcely a class of drugs, that has not been most systematically tried in the treatment of leprosy. Over and over again men of sanguine temperament have found what they called a specific cure, but in every instance calm and unbiased judgment has afterwards pronounced a verdict of uselessness.

How is it that these facts are not accepted, and a different line of therapeutic attack inaugurated?

Let us pay more attention to careful *symptomatic* treatment of leprosy. Even the advanced cases we can help and benefit a great deal more than is generally believed. The great number of incipient cases will furnish us opportunities enough to try new lines of specific treatment.

Let the scourge this nation is subject to be turned into as much good as possible, and let arrangements be made (for it is not feasible, under the present circumstances,) to let at least a limited number of advanced patients be benefitted by modern medical and surgical progress. On the other side, let the incipient cases be divided into classes, and treated systematically on different principles, but under one general management and observation.

I beg to refer you to my first report, written for the Session of the Legislature of 1884. I have already then dwelt on this point, and, I am happy to say, not without results. My suggestions of a home for suspected and incipient cases, and of regular medical school examinations, have been carried out, and order and cleanliness prevails, where there was an acknowledged bad state of affairs before 1884. But if you ask me whether enough has been done to be able to say to the world that all is being done for the lepers that can be expected, and in a model way for other nations, looking with fervent interest to Hawaii's fight with leprosy, I must say no. The therapeutic side, the treatment is neglected.

I have been told that my views are too advanced. I answer, that I am proud of it, and that I consider nothing can be too advanced in the treatment of a question which has been grappled with for centuries in the old style of isolation and feeding.

What I have repeatedly applied for is a small hospital-ward within the Kakaako enclosure, with say no more than 6 or 10 beds, but managed separately from the general settlement. This hospital should have a nurse and a servant attached to it, and to it exclusively; have arrangements for hot and cold and permanent baths, steam baths, gas baths, etc., and ought to be fitted with all the necessities of clinical research, and medical, surgical and electrical treatment. The patients would be selected from the general flock, according to the wishes of the physician put in charge of this trial station. Then the journals, which would have to be strictly kept of every case, would be able to contain all that accurate information, without which modern clinical work is considered incomplete, and which it is impossible to gain under existing circumstances. Then electrical treatment, which is undoubtedly of great, even surprising benefit,

could be carried on ; and surgical operations, such as removal of necrosed bone, stretching of nerves, cutting and stretching of contracted muscles and sinews, and operations on the eye, and other important organs, be attempted with more view to success than is possible at present, where no arrangements of any kind are made for all this at the Branch Hospital.

The therapeutic results I have achieved, under less favorable circumstances than those enumerated would offer, urge me to renew this request.

After these general remarks I will, in a cursory way, state the methods of treatment I have adopted for different classes of lepers, native and foreign, some treated at Kakaako, some as outside patients. Some 60 cases I find in my private books, which I look upon as either fully developed and progressive, or abortive, or incipient, or suspicious cases of leprosy. A number of them have since been received at the Branch Hospital, a number of foreigners have left the country, others I have lost sight of, and some few I consider so far benefited by continuous treatment, that I might doubt their being afflicted if I did not find the record of their previous state in my books.

Since about a year I have found in the external use of salicylic and pyrogallie acid agents of undoubted value for symptomatic local treatment. With them it is possible to destroy leprous tubercles and soften diffused leprous infiltrations, sometimes even to restore a portion of the feeling lost over these infiltrated patches. Especially the conspicuous red patches, which usher in the commencement of tubercular leprosy, and often stand for years without fading, subside readily under local treatment with an ointment or paste containing 10 per cent. of salicylic acid. Isolated tubercles and serpiginous leprous papules have been entirely removed with a strong solution of pyrogallie acid in traumaticine, or with a 10 per cent. pyrogallie acid ointment. For the diffused leprous infiltrations, I use a 10 per cent. solution of salicylic acid in oleic acid. Internally, I have used either nothing, so as to be sure that the disappearance of the symptoms was due to the local applications alone, or salicylic acid in large continued doses. I have certainly seen fresh febrile eruptions occurring during this treatment, but in several cases a decided improvement, even when used without any local treatment.

Special reasons induced me to try a very active *sulphur* treatment in one case. Sulphur was administered internally as hyposulphate of soda, and the patient was subjected to a sulphurous acid gas bath every day for one hour. The more pronounced tubercles of the face were at the same time treated with compression and deep local injections of absolute alcohol, which caused prompt breaking down and cicatrization of the

tubercles. This method I have since discarded for the more efficient and less painful pyrogallic acid treatment. I am sorry to say that this patient, whom I had under this treatment for a full year, and who was one of those put under my special charge by the Board, was, like two other patients of this particular lot, removed from the Branch Hospital without my knowledge. Such steps are naturally not inclined to promote scientific work. In deciding the advisability of their removal I might at least have been asked, and my reasons for retaining them weighed with those which prompted the action of the Board.

The much-abused *mercurial* treatment has been used both as a general and local application. For the general treatment I have relied chiefly on hypodermic injections of corrosive sublimate, a centigramme of the drug being injected daily. In one case of a well-educated native man, who has been under my treatment for nearly two years, I have given two courses of these injections—one of a hundred, and the next of sixty—without any trouble, although the injections are a little painful. His enlarged ears were treated with excisions and deep scarifications, and an anæsthetic spot on the back and the anæsthetic big toe of his left foot were successfully treated with electricity. The patient now feels that he has regained his lost strength and mental activity, looks hale and hearty, and would pass very close scrutiny without being considered in any way suspicious. For all that I do not for a moment pretend to have effected a lasting cure—that remains for time to prove; nor do I feel inclined to let the patient go without further treatment, though he is apparently in vigorous health. He is at regular periods taking small doses of mercurials, and should go on with this for a number of years.

In another case of a rapidly progressing mixed form the quick course of the disease has changed to a slow progress after eighty hypodermic injections of corrosive sublimate. I am sorry to say that this is one of the cases taken out of my observation at the Branch Hospital. The anæsthetic and contracted hand was steadily improving when I was treating it electrically at my office. This had to be discontinued when the patient was removed to the Branch Hospital, no appliances for this purpose being provided for there. Since her dismissal she is under no treatment whatever, but, as I hear, in the family-way, and losing the improvement she had gained in her hand.

In other outside cases I have used *creosote* and *carbolic acid* treatment, the former in pills of which Dr. Hillebrand speaks very highly, the latter as hypodermic. Only in one case did I see marked effects. In this, local injections of a five per cent. car-

bolic acid solution were used, and restored colour and feeling in a white anæsthetic spot on the cheek.

Iodide of potassium failed entirely at my hands.

Electrical treatment was used in quite a number of anæsthetic cases, and when persevered in long enough proved very efficient. One patient especially, a white man, who had several anæsthetic patches on the arms has recovered entirely. He has at the same time been taking from 1½ to 3 grammes of salicylate of soda daily for a whole year. Another patient, a native woman, who had, besides other symptoms, a nearly complete anæsthesia of the left arm and contracted useless hand for over ten years, is now enabled to stretch her fingers and use them for needle work, the feeling being completely restored in two of the fingers. The treatment in her case has extended over very nearly 18 months, and very high doses of *arsenious acid*, up to 9 centigrammes daily, have been taken internally, the patient standing this drug extremely well, whilst from some other experiences I have learned to be extremely cautious with this drug in the treatment of leprosy.

The very distressing symptoms on part of the nose, mouth and throat, which are in the general run of the treatment of leprosy all helped to a gargle and nothing more, deserve especial attention for several reasons:

1. There is nothing so apt to run down the appetite, and with it the general health of the patients, as the continual swallowing of putrid matter from festering sores of these parts.

2. The discharge from these sores containing the bacillus in great numbers, as stated above, there is sufficient ground to believe that like in similar cases of tuberculosis, the above specified leprous ulcerations of the bowels are caused by self-infection from swallowing the pus secreted from these sores.

3. The heavy breathing and hoarseness, the disgusting smell and the ever abundant secretion makes these patients doubly loathsome and dangerous.

My experience teaches me that these ulcerations are especially amenable to local treatment. The daily application of antiseptics, caustics, and astringents, as the case may require, the fixing of ointment tampons, the use of medicated sprays and steam inhalations, all this can be used with much success, and ought to be used in a hospital for lepers.

Similar arguments relate to the treatment of the disease of the eye so common in leprosy. I firmly believe that *early* operation for leprous nodules on the conjunctiva, and for leprous iritis will rescue a large number of the unfortunates from irretrievable blindness, and the paralytic drooping of the lower eyelid which so commonly leads to loss of vision in leprosy, may

just as well be benefited by plastic operation as it is in facial paralysis from other causes. But to effect all this, and a great deal more which I will not detail, there is required good will on all sides. On part of the physician it must be brought, and on part of the patients it will have to be courted and enforced by more vigorous support of the medical work by the Hospital Board, working in concord, and with the advice of the hospital physician.

I now draw to the close of this report with a few remarks as to

V.—*Hygienic* measures. I will skip the common-place, but nevertheless all-important subject of general sanitation and improving the social habits of the people, but try to give some more definite points.

Traveling round the islands to gain information on these subjects, I found in some parts, especially so in parts of Kauai and Maui, more lepers at large, and in unconstrained intercourse with the healthy population than ought to be under the present laws. Now I do not think it possible for the Government to take charge of all lepers, but as long as the powerful law of segregation is in force let it be brought to bear on cases which are really complained of as public nuisances. I have intentionally visited the remotest gulches and corners where but few white men penetrate, and have found more bad cases of leprosy than I expected. Perhaps it may be just as well to leave these poor wretches in their homes, where they are just as much or more out of the way than at Kakaako or Kalaupapa; but there is an important point to consider. Pent up with these bad cases in their squalid huts and houses are apparently healthy children. These ought to be removed, for they are the future and hope of the nation. And not alone the girls, but also the boys should be removed, especially so as old and new statistics point to a prevalence of leprosy among the male sex.

But one thing must be avoided if we accept the theory of disposition in children of leprous parents. We must keep these out of harm's way even more carefully than other children whose families are free of the taint.

I know that it is acknowledged by Your Excellency and the members of the Board that the present Kapiolani Home is not in its proper position, and that only the most pressing circumstances have necessitated the selection of the present site.

From my point of view I must stand by my original proposal to have the Home out of sight and reach of the Leper Asylum. If we want to keep the possibly-disposed systems of the chil-

dren free from the disease, the first step should be to remove them as far as possible from it, and not to tabu them within the walls of a lazaretto.

The next point touches the vaccination question, with which I have dealt at length under the heading of experimental work. I would further urge that the *medical examinations of school children*, which has led to the elimination of quite a number of cases, should be kept up regularly and carefully. As an instance of their necessity, I may quote a case which has quite recently come under my observation. A little girl (native) belonging to one of our large schools passed my close examination a year and a half ago as healthy, but now presents initial symptoms of leprosy. We must not rely on general healthy appearance in these examinations, and on a furtive glance at hands and arms. I have found unmistakable marks of leprosy on the back of a child that held a recent health certificate. Moreover, we shall have to extend our examinations even to very young children in spite of Dr. Fitch's assertion that leprosy does not make its appearance before the period of second dentition. I have seen a child with clear signs of leprosy at 3½ years of age, and know of another boy who was a marked case at 4 years old.

As this country has to rely on immigration mainly coming from countries where leprosy is endemic, *i.e.*, China, the Azores, and Japan, considerable care ought to be exercised in guarding against new cases of the disease being imported from there. I know of two unquestionable cases of leprosy having come here from the Azores—the one was the Portuguese man mentioned above, the other a young Portuguese girl who, immediately after her arrival, half a year before I was asked to examine her, obtained a position as nurse in one of our best families.

Altogether it is deplorable, though perhaps inevitable, that these islands with their terrible abundance of leprosy should be repopulated by the very nationalities, who seem to have not yet overcome a disposition to the disease as much as other races.

There are two more points I wish to bring again before you, one of more local, the other of general and scientific importance. Both have been subjects of previous memoranda to the President of the Board.

The first applies to the necessity of furnishing a wash-house at the Kakaako Hospital to obviate the certainly unpermissible practice of some of the lepers sending their soiled clothing out to be washed.

The other relates to the *disposal of the dead bodies of lepers*. To make this report complete, I shall here insert the text of my previous communication, sent to the President of the Board, in June last:

To His Excellency W. M. GIBSON,
President of the Board of Health,

SIR :—I beg to submit to Your Excellency's consideration the following facts, which I have recently discovered with regard to the power of resistance of the germs of leprosy to putrefaction. I communicate this result of my work immediately to you, because it seems to me to have a direct practical bearing towards public sanitation.

A series of experiments in this line were commenced in October, 1884. Leprous tissue and matter was set aside under conditions of temperature and moisture most conducive to slow and thorough putrefaction, whilst the growth of the larger fungi was at the same time carefully excluded. From time to time a microscopical examination was made and the characteristic *bacillus lepræ* was not only found to hold its own against the germs of dissolution and putrefaction of albuminous matter, but met with so abundantly and laden with spores that the idea suggested itself there might be actual increase. An examination made a few days ago of the remains of this leprous tissue, set aside fully eight months ago, shows it to consist nearly entirely of swarms of the *bacillus lepræ*, closely packed. Every vestige of the cellular and fibrous structure of the tissue has disappeared, even the *bacteria* of putrefaction have crumbled up into a mass of detritus, but the *bacillus lepræ* is there with all its peculiar microchemical reactions.

The discovery prompted me to examine dead bodies of lepers under the ordinary and natural influence of decomposition. Not being able to acquire the desired corpse here, I went to Molokai, and succeeded in procuring parts of the body of a tubercular case, which had been buried for nearly three months, and was in the most active state of putrefaction. After what I had learned from my experiments, I was not surprised to find the leprous germ present in large numbers.

I candidly admit that I am not yet able to give a decisive answer to the question, whether these germs are alive and capable of reproducing the disease. This final question will not be solved till we have been successful in artificially cultivating and inoculating the germ, a result which none of us, who are engaged in this question, have as yet achieved. However, I feel personally confident, from the microscopical evidence alone, that they have not lost their power of germinating under the above named conditions. At any rate, it seems to me desirable to effectually bar even the possibility of a spread of the disease, through the slow decomposition of the dead bodies of lepers, in the grave yards surrounding the town. Cremation would certainly be the surest safe-

guard, but, as that can hardly be achieved, I suggest the compulsory filling up of the coffins containing the corpses of lepers with quicklime. To secure this end, I deem it necessary to stop the practice of letting friends and relations take away the dying lepers to their homes, as has recently been done in several cases.

* * * * *

Thus far goes my previous communication on this subject.

Let me close these observations and suggestions relative to the hygienic side of the question with the following general appeal. Increasing familiarity with a signal danger lessens our fear of it, but not the danger. This applies most pointedly to our relations to leprosy. We live amongst it, and there are many of us, not only Hawaiians, but also foreigners, who have grown so accustomed to it, that they not only do not heed it themselves, but by word and deed try to dispel the fears of others. This is all very well, and has its good side when it becomes necessary to dissipate a scare. But as long as this is absent it will be a good thing to sound a warning note from time to time, so that carelessness on part of the population may not be the outcome of assurances of safety. Examples like those of Father Damien, who has now himself become a leper, and as such a veritable martyr to his cause, and of other worthy and pure members of the community whose names I am not authorized to mention, should teach us a lesson, and cause us all to work harmoniously and united for the one good end, to confine the dreaded leprosy to its closest limits, and to help and support the poor afflicted ones with the best of our will and skill.

I have the honor to remain,

Yours most respectfully,

(Signed)

ED. ARNING, M.D.

APPENDIX O.

*Copy of Correspondence between the BOARD OF HEALTH and DR.
EDWARD ARNING.*

OFFICE OF THE BOARD OF HEALTH,
Honolulu, Nov. 30th, 1885.

ED. ARNING, M. D.

SIR:—By instruction of His Excellency Mr. Gibson, the President of the Board of Health, I have the honor to acknowledge receipt of your report as to the course of investigation carried on by you with regard to leprosy, dated Nov. 14th, 1885, addressed to him and to the members of the Board of Health, and am furthermore instructed to make the following remarks for your consideration and attention.

In the month of February of the present year, His Majesty's Government, through the Foreign Office, addressed His Majesty's accredited Representatives abroad, a series of questions somewhat similar to those propounded by the Royal College of Physicians in England, in 1862, to medical representatives of Foreign Powers in whose borders leprosy exists, or is suspected of existing. To these questions His Majesty's Government has received interesting and valuable replies in many instances. It is proposed to print these reports in conjunction with your report and other material of value in the study of leprosy. His Majesty's Government deeply appreciating the good will shown by other nations in collecting and forwarding, at no little cost of time, labor and money, the information required, is naturally anxious to reciprocate to the best of its ability by furnishing to such Foreign Powers all the information the Board of Health can obtain in regard to leprosy as it exists on the Hawaiian Islands.

It is reasonably considered that after the two years you have spent on these Islands in the service of the Board of Health with liberal emolument, combined with your high

recommendations to the Board as an honorable scientist and close and faithful student, and the facilities and opportunities it has placed at your disposal for experiment and observation, you have been enabled to acquire knowledge and information in regard to leprosy, of great value and importance to the Health Authorities of the Kingdom, and to all interested in the study of the disease. The impression is therefore felt that it is within your power to present a report of value and benefit to those engaged in battling with the disease abroad; creditable to this State and honorable to your talent and your position as the Government's Special Medical Representative.

I am not instructed to make any comments upon the report of Nov. 14th, farther than this, that in the opinion of His Excellency the President of the Board, it is incomplete and inconclusive, and not such a one as might be anticipated after two years of special labor, with considerable outlay of public funds.

I am instructed to speak of the report as incomplete by reason of references in it to notes and data not presented to this Honorable Board with the report, but mentioned as being retained or intended for "future publications;" and, furthermore, to request that you furnish to the Board by way of schedule or appendix, the schedule referred on page 12 of the report to "serve as a guide for examination of doubtful cases." It is also deemed proper that the "full notes," referred to on page 4 should be presented to the Board. On page 10 reference is made to photographs and casts of cases selected at Kakaako and Molokai, the President expects that duplicates of these be placed in possession of the Board; allowance being made for any extra expenditure on your part; and, also, the notes of autopsies made by you on Hospital cases should be given for future medical reference.

On page 32 occurs this, "I will, in a cursory way, state the methods of treatment I have adopted for different classes of lepers, native and foreign, some treated at Kakaako and some as outside patients." The President is of opinion that the notes of such cases or some of them would materially aid to the scientific value of your report abroad, and should be furnished.

On pages 40 and 41 reference is made to your "traveling round the Islands," in search of information, and also to the large numbers of lepers on Kauai and Maui, "in unconstrained intercourse with the healthy population."

The President will be pleased to receive more definite information on these matters, for the consideration of the Board.

A more extended notice of the large body of leper patients whom you have visited on Molokai could not fail to be of interest.

Having outlined the views of His Excellency the President for your consideration,

I have the honor to be, Sir, your most obedient servant,

FRED. H. HAYSELDEN,
Secretary Board of Health.

HONOLULU, Dec. 15th, 1885.

To His Excellency W. M. GIBSON,

President of the Board of Health.

DEAR SIR,—I am in receipt of the letter of the Secretary of the Board of Health, dated Nov. 30th, and regret that my report on the progress of my investigation of Leprosy is unsatisfactory to Your Excellency.

I will beg to state, that after due consideration, and after having submitted my report to some of my medical friends, viz., Doctors Trousseau, McKibbin and Brodie, I cannot modify it or make a more extensive one. My friends and myself are of opinion that, as information for a lay Board of Health, it is as complete and conclusive as necessary.

It is far from my desire to have, for the present, a full scientific report published, as my investigations are not nearly completed, and will probably take many more years to allow me to come to positive conclusions.

Footing on the preliminary correspondence between Your Excellency and Dr. Hillebrand, and our own conversation after my arrival, I could not look upon the moderate salary allowed me by the Board otherwise than as an assistance and encouragement to purely scientific work; but never for a moment understood that either my work or notes, or specimens, etc., could be claimed by the Board for its own purposes. The above were mostly obtained at my private expense, and for my private use; and, therefore, I must decline to furnish duplicates, or put at the disposal of the Board, my private

notes of cases and post-mortems, these being collected for future scientific information and publication.

It is unnecessary to say, that in these latter due credit will be given to the Hawaiian Government for all assistance rendered to me.

I have, however, keenly felt that this assistance was not such as I was led to expect from the above-mentioned correspondence, especially as far as moral support was concerned.

I further beg to state that I did not visit the Lepers on the other islands with the intention of gathering information for the Board of their whereabouts, but for my own private knowledge, to be able to judge of the causes of the continued spread of leprosy, in spite of segregation. The finding and segregating of these cases is a duty devolving on the public and local Government physicians.

I have the honour to remain, yours respectfully,

ED. ARNING, M. D.

OFFICE OF THE BOARD OF HEALTH,

Honolulu, Dec. 22d, 1885.

ED. ARNING, M. D., Honolulu.

SIR:—By the instruction of His Excellency the President of the Board of Health, I have the honor to inform you, that by a recent resolution of the Board, a special committee was appointed to make such reduction in the Medical Staff of the Government as they deemed advisable: and, acting under this authority, it has been decided to discontinue your services on the Staff.

Your statement to the President, in your letter of the 15th instant, that it will take you many years to come to positive conclusions in your medical investigations; that you never understood that your work, or notes, or specimens could be claimed by the Board, and as you decline to furnish duplicates, or place at the disposal of the Board any notes of cases or of autopsies:—all these being collected, as you state, for future scientific information and publications, satisfies the Board, after the expenditures made on your account, of the propriety of their action in this matter.

Your appointment as a resident physician, in the employment of the Board, will cease on the 31st instant; and be-

tween now and this date you will vacate the offices situated in the Kakaako Hospital enclosure, now used by you, leaving therein such articles as have been supplied to you by the Board.

I have the honour to remain, Sir, your most obed't serv't,

FRED. H. HAYSELDEN,
Secretary of the Board of Health.

HONOLULU, Dec. 28th, 1885.

FRED. H. HAYSELDEN, Esqr.

Secretary of the Board of Health.

SIR:—I have the honour to acknowledge receipt of your letter dated December 22d, 1885, informing me of the decision of a special committee of the Board of Health to withdraw my appointment as a resident physician in the employment of the Board by the end of this month.

The premises I have used for my work at Kakaako will be vacated by the 31st inst. I shall leave therein such articles as have been supplied to me by the Board.

I shall draw my salary of \$150 for December, on the 31st inst.

I furthermore claim the payment of my expenses connected with my return to Germany, which His Majesty's Government agreed to defray, and which I figure at five hundred dollars.

I have the honour to remain, Sir,
your most obed't servant,

ED. ARNING, M. D.

APPENDIX U.

*Copy of Correspondence between HON. C. R. BISHOP, and others,
and the President of the Board of Health, in regard to DR. ED-
WARD ARNING.*

HONOLULU, January 28th, 1886.

To His Excellency W. M. GIBSON,

President of the Board of Health.

SIR:—A number of the physicians of Honolulu, and many other gentlemen resident here, consider it of very great importance that the investigation by Dr. Arning, applying to leprosy, should be continued in a thorough manner for a further period of two years; and believing that the Board of Health will be not only willing, but quite desirous, of co-operating in a work which may be of inestimable advantage to this country, and of value to the cause of science and humanity the world over, by granting such facilities and moral support as are and may be within its power, the undersigned, a committee appointed by the subscribers to a fund in aid of such investigation, are authorized to assure Your Excellency that if such support and facilities as are necessary are granted by your Honorable Board for the period above stated, the salary of Dr. Arning will be paid from said fund.

Herewith we enclose copy of a communication, signed by a number of the prominent physicians of this city, expressing their views upon the matter in question.

Hoping for an early and favorable reply to the foregoing proposition, we have the honor to be,

Your obedient servants,

CHAS. R. BISHOP,
F. A. SCHAEFER,
J. B. ATHERTON.

[COPY.]

HONOLULU, January 25, 1886.

To Messrs. C. R. BISHOP, F. A. SCHAEFER, and J. B. ATHERTON,
members of the Committee of the Leprosy Investigation
Fund.

GENTLEMEN :—The undersigned, members of the medical profession residing in Honolulu, have learned that it has been decided by the Board of Health to discontinue the appointment of Dr. Arning as Physician in charge of Leper Patients in the Branch Hospital at Kakaako, and that the reason alleged for such removal is the necessity for retrenchment in the expenditure of the Hawaiian Treasury.

We consider that it is advisable, for the benefit of natives as well as foreigners, that the study of leprosy and the causes associating for its spreading should be continued.

Dr. Arning having come to this country for the express purpose of investigating in a scientific manner the causes of the spreading of this horrible disease, and being so well qualified for that work by study and experience, and so well equipped with instruments, we are of opinion that his removal, and the consequent interruption of the important work in which he has been hitherto engaged, will be little short of a public calamity, and will produce most unfavorable criticism in all other civilized countries.

We, therefore, hope that it may yet be possible to induce the Board of Health to reconsider its action, at least so far as to allow him all necessary aid and facilities for thorough and continuous experiments and investigations, and that you may be able to guarantee the payment of Dr. Arning's salary for two years without calling upon the Board for any help in that matter. It is a duty which we owe to our profession and to the public to make this statement, and to record our conviction that a grave error would be committed by any interruption of the investigations which Dr. Arning has conducted during the past two years.

We remain, Gentlemen, respectfully yours,

(Signed)

G. TROUSSEAU,
JOHN BRODIE,
JNO. S. MCGREW,
HENRI G. MCGREW,
N. B. EMERSON,
MRS. DR. EMERSON,
ROBERT MCKIBBIN,
CHARLES T. RODGERS,
G. H. MARTIN,
S. G. TUCKER.

OFFICE OF THE BOARD OF HEALTH,
HONOLULU, January 30th, 1886.

To Messrs. C. R. BISHOP, F. A. SCHAEFER and J. B. ATHERTON.

GENTLEMEN:—His Excellency, the President of the Board of Health, has instructed me to acknowledge the receipt of your letter (and its enclosures) of January 28th, 1886, in which you state that: "A number of the physicians of Honolulu, and many other gentlemen, resident here, consider it of very great importance that the investigation by Dr. Arning, applying to leprosy, should be continued in a thorough manner for a further period of two years: and, believing that the Board of Health will be not only willing, but quite desirous of co-operating in a work which may be of inestimable advantage to this country, and of value to the cause of science and humanity the world over, by granting such facilities and moral support, as are and may be within its power, the undersigned, a committee appointed by the subscribers to a fund in aid of such investigation, are authorized to assure Your Excellency that if such support and facilities as are necessary are granted by your Honorable Board for the period above stated, the salary of Dr. Arning will be paid from said fund."

In reply, I beg to say, on behalf of the President of the Board of Health, that the past history and conduct of His Excellency, in connection with the disease of leprosy on these islands, have proved his sincerity, energy and anxiety in the matter of dealing with it, both as a legislator and as a Minister. It is, perhaps, unnecessary to remind you, gentlemen, of His Excellency's successful efforts to induce the legislature of 1878 to grant the appropriation of \$10,000 for the medical scientific investigation of leprosy, or that it was at His Excellency's own suggestion, and by his correspondence with Dr. Hillebrand, and his own personal influence and exertion, that Dr. Edward Arning, himself, came to this country to pursue his studies and experiments, as a medical scientist, under the patronage of the Hawaiian Government.

It is, perhaps, equally unnecessary to refer, upon this occasion, to other practical measures for the benefit of the leprosy sick of the Kingdom, which have been initiated and carried out by His Excellency and his colleagues, except to enable you, gentlemen, to bear in mind that His Excellency's endeavors, in the interest of the lepers, and the public health generally, are unwearying and unabated.

In regard to the decision of the Board of Health "to discontinue the appointment of Dr. Arning," I would beg to recall to your memories the following extract, from a portion of a letter from Dr. W. Hillebrand, to His Excellency, dated Dec. 16, 1882, and published in the report of the Board of Health to the Legislature of 1884: "That in consideration of the important results for the welfare of the Hawaiian people, which are likely to derive

from the intended investigation on the contagium of leprosy, the Hawaiian Government declares itself ready to assist Dr. Arning, either by a direct grant or otherwise. The sum in question is very moderate, simply large enough to cover the expense of living on the islands for the space of nine months. I imagine that you will be justified to set aside a small portion of the money appropriated by the Legislature for sanitary purposes. If not, you can appoint him physician to the Leper Settlement, where Dr. Arning will be obliged to spend the greater part of the time."

Dr. Arning arrived in Honolulu the 8th of November, 1883, and has received from the Hawaiian Government a salary, as a Government Physician, of \$150 a month since that time, together with sundry outlays in connection with his experiments, making an aggregate of over four thousand three hundred dollars (\$4,300). The period contemplated for his proposed investigations, and the cost thereof, have as you, gentlemen, will readily observe, been considerably extended, in the hope of securing tangible results in the cause of medical science.

His Excellency, consequently, after the lapse of so much greater time than was originally anticipated, and the very liberal expenditure of public monies, desired to obtain from Dr. Arning such a report of the progress of his labors as would give to the incoming Legislature some strong evidences of justification for the expenditure, be an indication of future requirements and appropriations, and an aid to the consideration of the ultimate value of such investigations to the Hawaiian people, and the world at large, and the outlining of the course to be pursued in connection with them, by co-operation, development or otherwise.

Upon the receipt of Dr. Arning's report by His Excellency in November last, a correspondence (of which printed copies are enclosed) ensued, which terminated in the Board of Health discontinuing Dr. Arning's services. Retrenchment was not given as a reason, as this correspondence plainly shows; and, as a matter of fact, the scientific investigation of leprosy will be continued by the Board. Dr. Arning, as you, gentlemen, will read, was requested by His Excellency to supplement his report with further information, a most reasonable request, and one which it might readily be anticipated, a willing student or investigator, receiving the financial and moral support of the Government, would accede to. The terms of the declination appear. Upon His Excellency receiving Dr. Arning's assurance that it was not his intention to contribute the information required, and that, practically, the information was intentionally withheld, from motives other than those of humanity and science, and the en-

abling the Hawaiian Government to intelligently consider the value to the country of Dr. Arning's elaborate experiments and labors, it was deemed proper to cancel an apparently unlimitable engagement—at any rate, until the meeting of the Legislature.

His Excellency's desire has been to lay the foundation in this city of a repository of medical knowledge for the use of all medical men, and others interested in leprosy, and to collect there for reference, specimens, photographs, notes of cases and experiments, books of reference, and so forth, such as would be of infinite value to medical observers and practitioners. As a preliminary to this His Excellency has obtained from Foreign Governments the information referred to in the correspondence with Dr. Arning, and it was not unreasonable to expect that a distinguished scientific student, "commissioned by one of the highest scientific bodies," from no motives of gain, but prompted by the simple enthusiasm of science and philanthropy, would cheerfully avail himself of an opportunity to aid his fellow men in so philanthropical a cause.

His Excellency desires me to express his cordial commendation of the humane and patriotic spirit which has induced you, gentlemen, and others, to provide for Dr. Arning's salary for two years in order to enable him to continue his investigations, and I am instructed to say that His Excellency will be glad to provide all such facilities and moral support as may be accorded within the law, by the Board of Health, to promote scientific or other investigations, or experiments, by any foreign physicians coming here accredited by a scientific body, or by their respective Governments.

As Dr. Arning has already had over two years' experience in the investigation of leprosy in this country, His Excellency will be glad to afford him farther opportunities to study the disease, under what he deems most favorable conditions, with all the surroundings that could be desired by a humane and earnest scientific investigator—by enabling him to pursue his investigations at the Leper Settlement on Molokai. At that place there are upwards of 600 lepers of all ages, sex, and condition, and in varying stages of the disease; and, furthermore, Dr. Arning will find there several of his former patients whom, he says in his report, were removed from his charge and treatment.

His Excellency will recommend to the Board that Dr. Arning be provided with a house at the Settlement for a private residence, with out-buildings for small hospitals and laboratory, and such patients as he may desire to have placed under his special charge under conditions not in conflict with the general medical management of the physician of the Settlement. His

Excellency will also recommend that Dr. Arning be provided with rations, or an allowance in lieu thereof; with one or two riding horses, and with one or more animals, such as sheep, hogs, etc., that can be found at the Settlement, and may be required for inoculation or other experiments. He will be permitted a reasonable liberty of action, and all facilities and moral support within the power of the Board of Health to accord to him.

I have the honor to be, Gentlemen,

Your most obedient servant,

FRED. H. HAYSELDEN,

Secretary Board of Health.

HONOLULU, February 8th, 1886.

His Excellency W. M. GIBSON,

President of the Board of Health.

SIR:—We have the honor to acknowledge the receipt of the letter of the Secretary of the Board of Health, in reply to our letter of the 28th ult., to Your Excellency.

Without attempting to reply to all points in the Secretary's letter, we will give our attention to that part most pertinent to the object we are charged with—that is, the paragraph which reads as follows: "As Dr. Arning has already had over two years experience in the investigation of leprosy in this country, His Excellency will be glad to afford him further opportunities to study the disease under what he deems most favorable conditions, with all the surroundings that could be desired, by a humane and earnest scientific investigator, by enabling him to pursue his investigation at the Leper Settlement on Molokai. At that place there are upwards of 600 lepers of all ages, sex, and condition, and in varying stages of the disease; and furthermore, Dr. Arning will find there several of his former patients whom he says in his report were removed from his charge and treatment."

As Dr. Arning has heretofore been permitted to pursue his investigations at Kakaako (the Branch Hospital for Lepers), as well as at the Leper Settlement on Molokai, and as those acquainted with the two localities, know the former affords many conveniences and advantages (to say nothing about the greater personal risk and privation at the Settlement), which could not be provided at the latter without large additional expense to the physician, as well as to the Treasury, and in some important

particulars could not be provided at all, we cannot regard the letter of the Secretary, as it now reads, otherwise than as withholding suitable facilities for further investigation by Dr. Arning. You, no doubt, anticipate his declining to be confined to the Molokai Settlement, and he will have no reason to fear that his reputation as a "humane and earnest scientific investigator," will be compromised by doing so. There is no doubt as to the liberal disposition of the Legislature of this country in the past, or for the future in all matters relating to the public health, and that body is not likely to regard the sum already expended, or that will be required in the future for Dr. Arning's services if he is permitted to continue them, as excessive or mis-spent.

Dr. Arning is, we believe, the first scientific investigator, who has come from abroad, to devote himself to the study of leprosy, since the government began the care for the lepers, and if he is compelled to stop in the midst of his work for lack of support and facilities within the control of the Board of Health, it is unlikely that any other foreign physician "accredited by a scientific body, or by his government," will offer his services for a like purpose.

Without further preliminary, we now beg to state what Dr. Arning considers requisite, in order to pursue his investigations in a manner most likely to lead to valuable results, which is substantially as follows: Free access to the Branch Hospital at Kakaako, and to the Leper Settlement on Molokai, for himself and his assistant, and to all of the inmates at both places; a separate hospital ward of eight beds at Kakaako, for four male and four female cases, to be selected by himself; the ward to be fitted and appointed as stated in his late report to the Board of Health; a room attached to the ward with a northerly light, and with water, etc., for special work; a convenient place for such animals as are necessary for experiments; and also the firm and hearty support of the Board, in certain work, which may not be agreeable to the mind of the patients; but which forms a most essential part of the investigation, i. e., regulation of diet, enforcement of special ward rules, surgical operations, post-mortems, etc.; and finally, it should be understood that no patient will be removed from his care without his knowledge, and without reason given therefor.

If, in the foregoing, anything is asked for which cannot be granted, we shall feel much obliged if Your Excellency will state what item it is, so that we may see whether or not it can be omitted or arranged for in any other way; but if the Honorable Board of Health will not grant the facilities within its control, or declines to provide such facilities at Kakaako, then the purpose of those who are willing to assist with their means

in promoting this important investigation in the interest of the public, will be defeated, and Dr. Arning will not be detained any longer, a result which we should greatly regret.

We remain, Sir, your obedient servants,

CHAS. R. BISHOP,
F. A. SCHAEFER,
J. B. ATHERTON,
Committee.

OFFICE OF THE BOARD OF HEALTH,
HONOLULU, February 10th, 1886.

To Hon. CHARLES R. BISHOP, F. A. SCHAEFER, Esq., and J. B. ATHERTON, Esq. :

GENTLEMEN :—I have the honor to acknowledge receipt of your letter of the 8th inst., and have to say, in reply, that I am somewhat surprised at its contents, especially at the tone in which the declination of the offer made by me in behalf of the Board of Health to you, on Dr. Arning's behalf, is conveyed.

Apparently it would be useless to reiterate or enlarge upon the advantages, which I believe the Leper Settlement on Molokai (the chief centre of the disease, where there are over 600 cases of confirmed leprosy), possesses over the Branch Hospital at Kaka-ako (with barely one hundred cases of a much milder type), for such a line of investigation as is proposed by you for Dr. Arning.

It suggests itself in this connection, to my mind, that the assistance and co-operation of such an able and experienced physician, as the Resident Physician at the Settlement, should be worthy of some consideration, as it might be of practical benefit to Dr. Arning, who certainly could endure, equally with Dr. Mouritz, in the cause of science, "the greater personal risk and privation at the Settlement."

The uncalled for assumption conveyed by the expression, "you no doubt anticipate his declining to be confined to the Molokai Settlement," compels me to believe that Dr. Arning has met with unwise advisers, whose course of action throughout has been dictated, not entirely for the public welfare, nor by philanthropic interest in the progress of Dr. Arning's labors on behalf of the lepers; and I regret that, even in the cause of the sick, unworthy prejudices are permitted to intrude where charity, as well as science, should be supreme.

The *ultimatum*, it can scarcely be called a *request*, of "what

Dr. Arning considers requisite," I deem it necessary to say, must be most emphatically declined. In my opinion the proposal is one of such an important character in its present bearings, and future connections with established departments of the Government, that it should be reserved for Legislative discussion and action, in connection with other kindred plans and proposals relative to leprosy.

To grant the *demands* of those who claim to speak on behalf of Dr. Arning, would be, practically, to create an irresponsible extra-medical department for leprosy, capable, perhaps, in the hands of Dr. Arning, individually, of doing much good; but, at the same time, possessing the elements of discord, and the possibility of creating considerable confusion and mischief. Furthermore, it would be establishing a precedent, for creating indirectly a new and largely salaried office, the responsibility of which I do not feel inclined to advise the Board of Health to accept.

I beg to say, gentlemen, that I do not impute to you such a motive, in your anxiety on Dr. Arning's behalf, but I feel it proper to intimate that such a result would be a possible sequence to your present efforts,—if successful.

I regret that the offer made to Dr. Arning, on behalf of the Board of Health, in the letter of the Secretary of the Board, of the 28th ult., has been declined.

I have the honor to be, Gentlemen,

Your most obedient servant,

WALTER M. GIBSON,

President Board of Health.

APPENDIX H.

OFFICE OF THE BOARD OF HEALTH.

HONOLULU, January 30, 1886.

G. TROUSSEAU, M. D., Honolulu.

SIR:—I am instructed by His Excellency the President of the Board of Health to inform you that the Board purposes publishing, in connection with and in response to a very valuable series of reports sent to His Majesty's Government, by the authorities of Foreign Governments, a series of statements or reports in regard to Leprosy in the Hawaiian Archipelago, in the humane hope that an exchange of information may be of some benefit to medical science for the better understanding of this dread disease.

I am also requested to state that any information you may feel disposed to furnish as to Leprosy on these Islands, (whether from your own experience in private practice or from knowledge otherwise acquired), or any opinions or suggestions as to the treatment socially or otherwise of Lepers, for publication and transmission to other Governments will be accepted with the consideration due to your distinguished professional position.

I am further instructed to request that, in the event of your being willing to contribute your views on this important subject, your manuscript should be forwarded to the President not later than March 1st.

I have the honor to be, Sir, your most obedient servant,

FRED. H. HAYSELDEN,
Secretary.

Similar letters to the above were forwarded to the following gentlemen: R. McKibbin, M. D., J. Brodie, M. D., N. B. Emerson, M. D.

Reply from Dr. Robert McKibbin.

HONOLULU, 1st Feb., 1886.

F. H. HAYSELDEN, Esq.,

Secretary of the Board of Health.

SIR:—In reply to your circular of 30th ult., I beg to state that in consideration of the manner in which the very able report of Dr. Arning, on leprosy, was received by the Board of Health, the way in which he has been treated, and his summary dismissal by the Board, in the midst of his (in my opinion) most valuable and important investigations of leprosy and its treatment, which cannot be as well, or as successfully, continued by any other person on these Islands; for the above, if for no other reasons, I feel reluctantly constrained from furnishing the Board with any report of my observations of Leprosy, or its treatment, or of offering any opinion on the subject whatever.

I have the honor to be, Sir,

Your most obedient servant,

ROBERT MCKIBBIN.

Reply from Dr. N. B. Emerson.

HONOLULU, February 8th, 1886.

To His Excellency W. M. GIBSON,

President of the Board of Health.

SIR:—I am in receipt of your favor of January 30th, inviting me to furnish any information I may feel disposed to as to Leprosy on these Islands.

In reply, I beg to state that I fully appreciate the immense importance of making a thorough study of Leprosy, as we find it in this Archipelago, and I also appreciate the difficulty and intricacy of such work.

In order to command in the highest degree the respect and confidence of scientific medical men, it is necessary that observations on the pathology, etiology and therapeutics of this truly formidable disease, should be made on a large scale, and should be based on actual practice and experiment, brought down to date, among such masses of patients as are collected at the Branch Hospital at Kakaako.

As I am not in the possession of any such facilities as these, and, therefore, cannot come up to my own standard of excellence in this matter, it hardly seems wise for me to undertake to make any communication on the subject.

I have the honor to be, Sir, very respectfully yours,

N. B. EMERSON.

Reply from Dr. John. Brodie.

HONOLULU, February 6th, 1886.

To His Excellency WALTER M. GIBSON,
President of the Board of Health.

SIR:—In reply to yours of the 30th ult., I am sorry to have to state that having made no special study of Leprosy, excepting in regard to its diagnostic features, I am unable to contribute anything of value to the literature of that disease. These opinions without notes of cases and treatment upon which to base them, would be worse than useless.

I have the honor to be, Sir, your obedient servant,

JOHN BRODIE.

APPENDIX K.

REPORT OF ARTHUR MOURITZ,

Resident Physician and Medical Superintendent at the Leper Settlement, Molokai.

MOLOKAI, February, 1886.

To His Excellency W. M. GIBSON,

President of the Board of Health.

SIR:—I have the honor to submit my Report on the Leper Settlement, and at the same time treating in detail the suggestions contained in the letter from the Secretary of the Board, dated December 21, 1885.

Whilst submitting the statements contained in my Report, I think it almost superfluous to draw your Excellency's attention to the difficulty attached to the prosecution of inquiries on the subject of Leprosy in this Kingdom, as knowledge of a clear and concise nature, from the very obtruseness of the subject, can scarcely as yet be gained.

The materials for drawing up true and reliable information do not exist in this country, or if they do exist at all, it is only within a very recent period; books, papers or any printed or written records are for the most part wanting. Viva voce interrogation of old residents (foreigners) give rise to such diversities of opinion, that only doubt and increased perplexity ensue in the mind of the interrogator; such means of seeking the truth, however, must not be put aside. Again, on the other hand, an obstacle of no small moment arises in the "total unreliability of the information received from the natives themselves," from want of a thorough comprehension and appreciation of the great importance and aim required in answering questions pertaining to scientific enquiry. To sum up briefly, no satisfactory information, bearing on the subject of Leprosy in all its phases, can as yet be given.

I wish at the outset to state that my personal views, and the information set forth generally, will, as far as is possible, deal with the subject of Leprosy as met with in the Sandwich Islands; also, that my statements and deductions apply to my own personal field of observation chiefly, viz., the Leper Settle

ment on Molokai, my connection with this establishment dating from November 1, 1884.

As to the Origin of Leprosy in these Islands.—On this point I must confess I have not found any information sufficiently reliable to be put on record as authentic.

When I first entered this country, a few years ago, I asked about the origin of Leprosy, interrogating physicians and many laymen on their own views of the matter, or if they had met with hearsay evidence. No two replies were alike, but most agreed that Leprosy did not prevail extensively in these Islands before the year 1860, some twenty-six years ago. If cases of the disease did exist previous to this date, they did not obtrude themselves on public view to a sufficient extent so as to be noticeable, or to call for any general comment.

According to the information set forth by Dr. Hillebrand, Leprosy was introduced into Honolulu by the Chinese in the year 1848, and the Doctor saw the first Hawaiian Leper five years later; ten years afterwards the disease had spread considerably in the immediate neighborhood of presumably the first propagated Hawaiian case.

These facts, as related by Dr. Hillebrand, are very valuable, and in so far as Honolulu is concerned may be quite sufficient to account for the appearance and spread of Leprosy there. But to conclude that from this focus the disease spread over the entire group, such a conclusion is open to many objections. Undoubtedly there must have been other forces at work to cause the disease to increase to its present proportions on all the larger islands. It is, however, quite possible that the Chinese carried Leprosy primarily to other places on the group besides Honolulu.

Mr. Brickwood, a resident on these Islands in the year 1840, recognized the disease of a certain native in Honolulu to be Leprosy. This gentleman had previous knowledge of the disease in another country where it prevails endemically, viz., Egypt. I have been able to meet with still earlier evidences of its existence. Whilst reading the published diary of one of the very early missionaries of the American Board of Missions, two passages in his writings are worthy of further consideration. One of these speaks quite possibly of Leprosy, the other mentions the fact of its existence. The writer of the published diary I allude to was the Reverend Charles Samuel Stewart, who landed at Honolulu on April 27, 1823. He has kept almost a daily record of events which occurred to him during his residence in these Islands. In Volume I, page 163, will be found the following entry in his diary a few weeks after his arrival, May 22, 1823:

"Nor to mention the frequent and hideous mark of a scourge, which more clearly than any other proclaims the curse of a God of purity, and which while it annually consigns hundreds of this people to the tomb, converts thousands while living into walking sephuleres, the inhabitants generally are subject to many disorders of the skin. The majority are more or less disfigured by eruptions and sores, and many are unsightly as *Lepers*. The number of either sex, or of any age, who are free from blemishes of this kind is very small, so much so, that a smooth and unbroken skin is far more uncommon here, than the reverse is at home."

I certainly think that from this extract alone, many of these skin diseases, this writer alludes, to may have been manifestations of Leprosy and not Syphilis.

From the vivid portrayal of the great prevalences of visible diseases, the Hawaiian race at that time must have been grievously afflicted with all the ills mankind is liable to, certainly the major portion.

Were this the only extract from Mr. Stewart's diary on the subject of the disease, the Hawaiians were afflicted with, it might be justifiable to conclude that Syphilis was at the root of all the maladies the aborigines suffered from, but on page 212 Volume I, Leprosy is distinctly mentioned.

"July 4, 1823.—Indeed we seldom walk out without meeting many whose appearance of misery and disease is appalling, and some so remediless and disgusting, that we are compelled to close our eyes against a sight that fills us with horror. Cases of Ophthalmic Scrofula and *Elephantiasis* are very common."

I think after reading these passages many will agree with the conclusion I have come to. That amongst the unsightly, hideous, remediless and disgusting cases, many were Lepers, perhaps very many more than the writer supposed.

That the author means *Elephantiasis Græcorum*, or true Leprosy, and not *Elephantiasis Arabum*, is quite apparent. The appearance of the latter has no parallel with that of the former. And again *Elephantiasis Arabum* has never been known to have existed here. It remains then that the *Elephantiasis* of the above passage is the true Leprosy, such as prevails at the present time amongst the islands of the group. * * *

The Segregation of the Lepers.—About the year 1864 the large increase in the number of Lepers commenced to agitate the mind of the community, and steps were taken to adopt measures to check the spread of the disease, and the Law of Segregation for Leprosy was enacted in January, 1865.

In November of that year a small hospital was established near Honolulu at Kalihi, capable of accommodating about fifty

inmates, where a somewhat systematic inspection could be made of those who were brought to the hospital as Lepers, many persons being arrested in error, the disease not being Leprosy. These of course were liberated; the mild cases, and those of moderate degrees of severity to whom some good might be expected to accrue from improved conditions of living and medical treatment, were kept in the hospital; the confirmed and hopeless cases were sent to the permanent settlement, the site of which had been selected at Kalawao, on the Island of Molokai.

Dr. Hoffmann, of Honolulu, who was connected with the Kalihi Hospital at its establishment, has kindly given me the following information: "Generally fifty cases were under treatment from time to time in the hospital, the cases being equally divided. The two usually described varieties of the disease existed, viz., the Tubercular and the Anæsthetic; the former as is usual, preponderated. During my charge between 600 and 700 Lepers were transferred to Kalawao. I found no permanent benefit from treatment; better food and cleanliness, medicine, suited to improve the general health of the Leper, ameliorated the disease temporarily."

The hospital at Kalihi was abolished in the year 1875. During its existence about forty Lepers died there, and some ten deserted, but all the others who had passed through its portals, (the diagnosis of the disease being certain) finally reached Molokai; many, however, being conveyed direct to the settlement from the other islands.

The Leper Settlement.—The Leper settlement on Molokai is situated about the centre of the north or windward coast of the island, and in so far as the question of isolation from the adjacent portion of the land is concerned, a better site could not have been chosen. Nature herself having disconnected the upland from the plain below; the intervention of a steep and lofty mountain chain completely encompassing the plain on the landward side. The plain is in the form of a tongue of land, three sides being washed by the ocean, the fourth or continuation of the base of the tongue ending in perpendicular cliffs, washed by the sea, affording no egress or ingress, except by boat or canoe. The extreme length of this tongue of land, which runs almost due north and south, is about two and three-quarters miles, at the base where the said portion of land joins the mountains its width is three miles, at the centre of the tongue two and one-half miles wide, and seaward toward the top one mile wide, comprising approximately eight square miles of surface, richly covered with grass, but totally devoid of trees. On the eastern side close to the base of the mountains lies the village of Kalawao. At a similar situation on the western

shore, but further removed from the mountains lies the village of Kalaupapa, the chief port of the settlement, where merchandise, food, etc., are generally landed, three and one-quarter miles seaward of Kalaupapa lies the small village of Iliki. Makanalua is placed close in to the mountains, midway between Kalaupapa and Kalawao; immediately opposite and to the seaward of this village rise the walls of the extinct crater of Kahukoo, which attains an elevation of 493 feet above sea level. This crater, when active, in conjunction with the soil washed from the adjacent gorges and side of the mountains, has formed the lands which comprise the Leper Settlement.

From the eastward edge of Kahukoo the land trends towards the sea, and ends in rugged, steep cliffs 70 feet high, making access to the sea a difficult and almost impossible undertaking. The north shore resembles the eastern, but the cliffs are less elevated—about 15 to 20 feet, and honeycombed by the force of the ocean. The north-west shore is level with the sea, and affords easy access to it, which, as the western shore is continued landward, becomes more difficult, even off Kalaupapa—the port. There is a considerable break in the rim of the crater of Kahukoo towards the north-east, where the lava has burst out; the elevated edges of this channel trend from north-east to north, forming a barrier which breaks the force of the north-east trade wind, and thereby affords some shelter to Kalaupapa. The village of Kalawao, as I have mentioned before, is situated on the eastern side of the leper reservation, and is exposed to the full force of the north-east trade wind—the usually prevailing wind—which assumes the proportion of a gale for days and weeks together, and it is chiefly on this account that the land is devoid of trees, together with the wind being strongly impregnated with saline matter.

During many days in the winter months the climate of Kalawao is most ungenial, being bleak, cold, and rainy; these conditions being of comparatively no inconvenience to the healthy, but to the leper a serious drawback. Then, again, the high cliffs, towering 3,000 feet above the village, effectually shut out the direct rays of the sun from the early hours of the afternoon.

Kalaupapa faces the west, is sheltered by Kahukoo from the prevailing wind, is further removed from the base of the mountains, and, therefore, has the direct benefit accruing from the sun's rays. The abundance of the grass affords evidences of a considerable rainfall, and this is the experience of the residents. In 205 days, dating from early in November, 1884, to the end of May, 1885 (the rainy season here occurring in the months of November, December, January, and February), rain fell on 101

days, sometimes continuously for days together; notably the end of April and beginning of May. I was informed, however, that 1885 was an unusually wet year.

The slope of the surface, and the geological formation (lava rock covered with a foot or two of soil) conduce towards good drainage, so that the heavy rainfall does not affect the health of the residents as it would do provided the surface water had opportunity of storage, which would then occasion subsoil dampness with its concomitant evils, excess of rheumatism, catarrhal complaints, and phthisis, ague, etc.

The mountain range, which shuts off the Leper Settlement, is continued east and west the whole length of the island of Molo-kai, gradually reaching a less elevation towards the westward, but towards the east rising until finally the mountains acquire an elevation of from 3,000 to 4,000 feet. The seaward side of this range of mountains, as viewed from Kalawao, is bold and rugged, and, after a rain storm, when numerous cascades fall from the mountain sides, the grandeur of the scenery is much enhanced; deep gorges, shut in on three sides by towering ramparts of rock, alone accessible by sea, further beautifies the natural scenery.

The appended table shows the average daily temperature in the shade, taken at 12 p. m. for eleven months:

	Centigrade Scale.
1884, November	23.4
„ December	22.2
1885, January	20
„ February	19.5
„ March	21.5
„ April	20.8
„ May	21.3
„ June	—
„ July	26
„ August	26
„ September	25.3
„ October	24.3

The water supply of Kalawao is obtained by partially damming a mountain stream, and from this storage it is conducted in pipes and distributed at intervals through the village. The quantity of water is mainly dependent, if not altogether, on the rainfall, which I have stated already is abundant, drought being a rare occurrence.

Kalaupapa has several springs situated on the beach; the quantity of water they supply is sufficient for domestic wants, but it is not over-abundant. Its quality is not good, being

largely impregnated with chlorides, and if other sources of potable supply could be conveniently obtained it would be highly desirable to dispense with its use for drinking purposes.

The dwellings provided for the lepers by the Board of Health are built of wood, whitewashed in and out, and are fairly comfortable, being a great advance on the accommodation provided in the early years of segregation.

The average accommodation provided for each leper is a cubic space of about 500 feet; at the present time, as the Settlement is not very full, each leper has nearly 1,000 feet of cubic space in his or her dwelling. Wooden houses not being airtight, 1,000 feet of cubic space is ample for mild cases of leprosy; but all bad cases should be accommodated on the basis of infectious diseases, and these should be provided with not less than 2,000 feet of cubic space, with 144 square feet of floor for each individual case.

The question of ventilation also requires careful consideration. The system at Kalawao has apparently never had attention given to it, and the result is that either the leper is chilled to the marrow, or he is poisoned by his own exhalations. Many of the lepers are encouraged by the Board to build better houses for themselves, and some are erected quite pretentiously, neat and clean in and out, approaching quite a degree of comfort.

The dwellings of the lepers are kept fairly clean by the inmates (except within the hospital enclosure); surrounded by a stone wall, enclosing an acre or so, also adds to the appearance of the cottages. Within this enclosure sweet potatoes, bananas, sugar-cane, and onions are generally cultivated, the edibles thus obtained adding materially to the ration of food allowed by the Board.

The interior of the Hawaiian house, generally, is devoid of furniture, the floor-mat or mats forming bed, bedstead and chairs; a few calabashes for food complete the equipment of Hawaiian domestic life. So it is carried on at the Settlement.

At Kalawao is situated the Hospital, or Home, where the worst cases are supposed to be accommodated. The site of this establishment is on the hill-side, about half a mile from the sea, and comprises an area of two acres, surrounded by a picket fence. Five wooden buildings, about 40 x 15, and six smaller erections, comprise the accommodation, the usual offices for preparing and storing food being in close proximity. Food, washing, and lodging are provided for the inmates, medical treatment if desired, and some attempt at nursing; but its main claim on the Hawaiian, appears to me, that he is saved the trouble of preparing his own food, washing his clothes, and procuring fuel.

Of course there are no cases of cure, and those who enter its portals remain till death releases them. Generally the Hawaiian is prejudiced against hospital restraint and treatment, not only here, but all over the islands. Many of the worst cases prefer to remain outside; the very cases the hospital was intended for do not avail themselves of the benefits we, as foreigners, think belong to such institutions. Whenever I have suggested to any sufferer outside, whom I thought would be benefited by a residence in the hospital, the desirability of having him removed there, with scarcely an exception the answer has been, "I prefer to remain, and die where I am." From these remarks, it is scarcely necessary to add that I have not thought it advisable to suggest to the Board that a post-mortem room, operating theatre, etc., and other such requisites for ordinary every-day hospital routine, should be added to the present buildings. For, had I any of these facilities, I could make but little use of them, as prejudice against innovation, and foreign medical ideas prevails largely.

With a few remarks on segregation, I will conclude this section of my report.

Very few lepers surrender themselves voluntarily—to do so is not the rule, but the exception; on the other hand, resistance is rarely offered to the execution of the law, the Hawaiians being a peaceful people; in this alone, when the execution of sanitary law is enforced, showing a lustrous example to many ancient nations, presumably more enlightened, who even now assail the execution of the simplest needful sanitary measures, the detention of the individual not being in the question. That lepers are frequently secreted by their friends is true, and quite natural that such should be the case, as no dread of the disease is manifested amongst the Hawaiians. The healthy live in the same house, eat out of the same utensils, sleep together in the same bed as the leper; all these conditions of life bringing them closely in contact with the disease, and by this means leprosy is, in my opinion, only too certainly and too frequently spread.

The law of segregation is actively enforced, as follows: On notice or complaint being given to the sheriff of the district, in which a leper resides, he (the sheriff) notifies the sufferer to appear before a physician (always a foreigner), or brings the leper to some public office (say court-house), then notifies the nearest foreign physician to attend and examine the case, whether of leprosy or not. If the diagnosis is certain, then by the easiest method and most convenient route or conveyance the leper is removed from his home, either direct to Molokai,

but more generally to the receiving-house at Kakaako, for further medical examination before being segregated finally.

That all lepers should be segregated I quite agree; that all lepers could be segregated is quite a different matter, and almost impossible, in fact. Severe cases generally become public nuisances; and are dealt with first, though even if left at large, they have the advantage of acting as danger signals to the foreigner, and to the populace generally, in nearly all countries but Hawaii. The inhabitants of the islands (the indigenous ones I mean) have always shown an utter disregard and ignorant contempt for leprosy, which slowly, but silently, seizes its victims; in fact, according to our foreign ideas of the manner disease is spread, the Hawaiian makes every effort to saturate his system with the poison of leprosy; that many only too well succeed, and thereby pay the penalty with their lives, will be shortly indicated in my tables, showing the arrivals and mortality at the Leper Settlement. In my opinion the great defect of the law of segregation of lepers lies in the fact that it carries no moral weight, and fails to get at the root of the evil; and until such time as the Hawaiian mind is impressed with the necessity of social ostracism being practised towards all lepers, not till then will the true advantages of public segregation in chosen sites be made manifest. Did social ostracism exist at the present day amongst the Hawaiians, as regards the leper, probably the non-contagious view of the disease might receive considerable support.

Lastly, whether segregation as carried out for the past twenty years, has had any beneficial effect on staying the progress of leprosy I cannot offer an opinion, my residence in the country being too brief.

In the following tables I have eliminated all kokuas, male and female, who had been placed on the list not as lepers, but drawing leper rations; these people entered into the lists of arrivals and deaths.

The rule of the Settlement, placing all children born in it on the leper list, swells the death list and the arrivals. When their death took place under twelve months, I have invariably struck them out of my mortality figures, as it was most probable they had not then become lepers. It happens, therefore, that there are a greater number of names on the list of lepers than I take account of, for the reasons above stated.

TABLE I.

Showing the number of Lepers received Annually. Their Sex. The number on the Books January 1st. The Mortality. Number discharged from the Settlement, (frequently as non-Lepers, frequently returned to Kakaako or Kalihi.)

Year	Number of Lepers Rec'd		Total.	Number on Books January 1st.	Mortality	Discharged
	Male	Female				
1866....	103	38	141		26	10
1867....	57	13	70	105	25	7
1868....	76	39	115	143	28	2
1869....	73	53	126	228	59	11
1870....	31	26	57	284	58	4
1871....	128	55	183	279	51	9
1872....	69	36	105	402	64	4
1873....	295	192	487	439	156	21
1874....	53	38	91	749	161	8
1875....	128	84	212	671	163	14
1876....	57	39	96	706	122	3
1877....	110	53	163	677	129	1
1878....	136	103	239	710	147	
1879....	82	43	125	802	209	1
1880....	34	17	51	717	152	10
1881....	156	76	232	606	132	
1882....	53	18	71	706	121	13
1883....	185	116	301	643	150	10
1884....	71	37	108	784	168	7
1885....	75	28	103	717	142	25
1886....				653		
	1972	1104	3076		2263	160

TABLE II.

Showing the number of Lepers received; the Mortality, and the number Discharged during the First Decade.

YEAR.	Number Received	Mortality.	Discharged
1866.....	141	26	10
1867.....	70	25	7
1868.....	115	28	2
1869.....	126	59	11
1870.....	57	58	4
1871.....	183	51	9
1872.....	105	64	4
1873.....	487	156	21
1874.....	91	161	8
1875.....	212	163	14
	1587	791	90

Number received..... 1587.

Mortality and discharged..... 881.

Number on Books January 1, 1876..... 706.

TABLE III.

Showing the number of Lepers received, the Mortality, and the number Discharged during the Second Decade.

YEAR.	Number Received	Mortality	Discharged
1876.....	96	122	3
1877.....	163	129	1
1878.....	239	147	
1879.....	125	209	1
1880.....	51	152	10
1881.....	232	132	
1882.....	71	121	13
1883.....	301	150	10
1884.....	108	168	7
1885.....	103	142	25
	1489	1472	70

Number received..... 1489.

Mortality and Discharged..... 1542.

Excess of mortality and discharges over those received... 53.

On Books January 1, 1876..... 706.

Less excess deaths and discharges..... 43.

Present on Books January 1, 1886..... 653.

TABLE IV.

Showing the nationality, number and sex of Lepers received annually from the foundation of the Settlement.

Year	Hawaiian		Mixed Hawaiians		White		Chinese		Other Nationalities		Total
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
1866	101	38					2				141
1867	56	12			1					§1	70
1868	72	37	2	2	1		1				115
1869	73	53									126
1870	31	26									57
1871	125	55	3								183
1872	69	36									105
1873	289	191	2	1			3		*1		487
1874	51	37	1	1	1						91
1875	121	82	2	2	3		1		†1		212
1876	55	39	1		1						96
1877	107	53	2				1				163
1878	134	101	1	2	1						239
1879	79	42	1	1	1		1				125
1880	31	17	2		1						51
1881	151	76	2		2		1				232
1882	49	18	1		1		2				71
1883	181	116	3				1				301
1884	60	37	3		2		6		†1		108
1885	68	28	2		1		3				103
Total	1903	1094	28	9	16		22		3	1	3076

* Rorotongan. † Mauritius. ‡ Manilla. § Lascar.

On reviewing Table IV the following figures are arrived at:

Total Hawaiians.....	2,997
Mixed Hawaiian blood	37
Chinese	22
Whites	16
Other nationalities	4
	3,076

The excess of male Hawaiians over female Hawaiians:

Males	1,903
Females.....	1,094
Excess.....	809

Therefore in twenty years the male Hawaiian lepers show an excess of 809 over the females; or, briefly, the male lepers exceed the females in the ratio of 19 to 11.

Again the excess of mixed Hawaiian blood males over female mixed Hawaiian blood is shown as under:

Males	28
Females	9
Excess	19

So that male mixed blood exceeds that of the same female race in the proportion of 3 to 1.

The excess of the male lepers over the female is no exception to the information received, on the same question, from all other countries where leprosy exists. The male lepers invariably exceed the female—(I know of no instance to the contrary)—due regard being paid to the excess of males over females in the general population.

The following tabulated statement gives the national distribution of the whites, etc.:

TABLE V.

Nationality.	No. of cases.	Remarks.
German	1	Dead.
	2	Dead.
	3	Dead.
	4	Alive: Lived 35 years here in the islands; arrived in Settlement 1879.
	5	Alive: Has lived in other countries where leprosy existed.
American...	6	Alive: Lived in these islands 14 years.
	1	Dead.
	2	Dead.
	3	Alive: Had lived in other countries where leprosy prevailed.
British	4	Alive: Lived in the country many years.
	1	Dead.
	2	Dead.
	3	Alive: Has lived in other countries where leprosy was endemic.
Pole	4	Alive: Born in these islands; British extraction.
	1	Alive: Previously diagnosed as syphilis.
Portuguese...	1	Dead: Had lived where leprosy was endemic (Azores).
Total	16	

The one male case in Table IV, from the Mauritius, was affected with leprosy when he arrived at these islands.

In regard to the number of lepers segregated annually, the largest number were segregated during the year 1873; in that year 487 lepers were received at the Settlement. With this large accession, the greatest number on the list reached a total of 809, comprised of 498 males and 311 females.

Again, ten years afterwards, another large reinforcement was received at the Settlement; this was in the year 1883, when 301 lepers were added to the list. On August 19, 1883, the daily recorded list shows a total of 841 souls—the largest number ever present at one time, these 841 persons being comprised of 512 males and 329 females. The smallest number of lepers received at the Settlement in any one year since its foundation was, in 1880, 51 persons, being placed on the books as fresh arrivals.

The numbers under the column head "discharged" comprise the following cases:

1. Non-lepers—these comprise the majority.
2. Sent to Honolulu for treatment.
3. Sent to Kapiolani Home.
4. Removed for crime.

The mortality figures need no special analysis into "per cents," the number of leper residents being small. The largest number of deaths in any one year occurred in 1879, when the mortality reached the total of 209, or 26 per cent.; but then it must be taken into account that there were a larger number of lepers on the list January 1st, 1879 (*viz.*, 802), than in any other year at a similar date.

The average mortality per annum for the first decade amounts to 22 per cent. approximately, and the average annual mortality for the second decade is 20 per cent. The greatest number of deaths recorded in any one month was in May, 1880, the total reaching 38.

I have collected and tabulated one thousand eight hundred and twelve cases of leprosy, the books, unfortunately, not permitting me to analyse the whole number of native lepers received since the foundation of the Settlement (January 6, 1886); these amount, as already shown in Table IV, to 2,997 persons.

The headings of the following table show the analysis of these 1,812 cases chiefly in the matter of their insular distribution. Three of the main islands (Kauai, Oahu, and Hawaii), as regards the number of lepers to the whole population of each island respectively give almost the same result.

Maui shows an excess of lepers to its population, *viz.*, 1 to 17 in comparison with the three other large islands. This island (Maui) also stands out prominently with "distinct excess" of lepers, calculated per one hundred inhabitants.

There are also several local districts included in the main districts in which the number of cases of leprosy segregated from these said smaller local districts appears excessive; whether so relatively to the population I have no means of accurately determining, the census returns simply giving the population in bulk.

Such excess for local districts are given in this table, the number of lepers being equal in several:

TABLE VI.

Island.	Local District.	Number of Lepers.
Kauai	Hanapepe.....	18
Oahu	Kaneohe	18
"	Heeia	15
Maui	Kaupo	15
"	Waikapu	18
"	Waihee	34
Hawaii	Waipio	37

TABLE VII.

GEOGRAPHICAL DISTRIBUTION AND PREVALENCE.

The following tabulated statement shows an analysis of 1,812 cases of leprosy, taken from the records at Kalawao (calculations approximate, fractions omitted, and native population only dealt with), showing number of lepers in each district in proportion to the population :

ISLAND.	DISTRICT.	No. of Lepers.	Proportion of Lepers to 100 population...	Ratio of Lepers to whole population of each island.....
Kauai	Koolau	48	6	1 to 23
	Halaleia			
	Puna	34	3	
Nihau	Kona	80	5	1 to 23
	Niihau			
Oahu	Honolulu	408	4	1 to 23
	Ewa	30	3	
	Waianae	13		
	Waialua	38	6	
	Koolauloa	31	3	
	Koolaupoko	35	3	
	Kona	111	7	
	Wailuku	166	6	
Maui	Makawao	64	3	1 to 17
	Hamakua	47		
	Hana	67	7	
	Kahikinui	20		
	Kohala	107	4	
	Hamakua	75	5	
Hawaii	Hilo	125	5	1 to 24
	Puna	23	3	
	Kau	38	3	
	Kona	126	4	
	Koolau	89*(1)	22	
Molokai	Kona	34	3	1 to 29
Lanai	Lanai	3	2	1 to 50
		1,812		

*(1) Formerly kokuas, now lepers at Kalawao.

TABLE VIII.

Table showing at a glance the number of lepers in each district, etc., to every 100 persons (Hawaiians).

2 per 100.	3 per 100.	4 per 100.	5 per 100.	6 per 100.	7 per 100.	22 per 100.
Lanai.	Puna (Kauai) Ewa Waianae Koolauloa Koolaupoko Makawao Puna (Hawaii) Kau Kona (Molokai)	Kona Hawaii Kohala Honolulu	{ Kona Kauai Niihau Hamakua Hawaii Hilo	{ Koolau Kauai Halalele Kauai Waialua Oahu Wailuku	{ Hanā Hanakua Maui Kahiki- nui Kona Maui	Koolau Molokai Formerly ko- kua now lep- ers at Kalawao Kamaainas Wailua Pelekunu
1	8	8	8	8	2	1

CONTAGION.—The whole history of leprosy in the Hawaiian Islands from its propagation to its present rapid spread, and development, verily proves that it can only be accounted for by regarding it as a contagious disease. Whatever else may be said of its being non-contagious in other ancient countries where the disease exists endemically, these statements do not apply, or should not apply, to the disease in the Hawaiian Islands. There is very little comparison justifiable; there is no true parallelism existing. Even in other countries where the disease has existed for centuries, the question of contagion or non-contagion is not definitely settled, the evidence tending in many cases to affirm contagion; in many other to negative this conclusion.

How any competent observer concludes that leprosy is non-contagious in these islands is to me only accountable by presuming "that previous views from extraneous sources has clouded his powers of observation."

That leprosy did not prevail on these islands until many years after they were open to foreign intercourse receives great confirmation in the fact that no true aboriginal word is in use for the name of the disease. I consider this a most significant illustration of the rapid spread of leprosy within a comparatively short era. I believe it perfectly safe to affirm that did leprosy exist amongst the ancient Hawaiians they would not call it, as the present race do, "Chinese sickness." Whatever defects the Hawaiian language may have, a very casual observation shows that it was, in the highest degree, and is, a language of minuteness and exactitude; and it can scarcely be imagined that naming a slow progressive disease, like leprosy, was beyond the power of their intellect, and yet this is really what those who

claim to trace a hereditary development of the disease ask us to do. The name "mai pake" may, no doubt, have originated on the interrogation by a native of a Chinaman, "What is this disease?" The Chinaman would probably answer, "I do not know the Hawaiian word, but there are plenty of people sick with the disease in my country." I think this origin of the word is more probable than the explanation given "that the disease was called 'mai pake' because the Chinese brought it." Chinese lepers do not generally emigrate, though the disease may appear after their arrival in the islands. At what period the Chinese first entered the country I do not know; I know it is related that some Hawaiians visited China about sixty years ago. As I have before mentioned, Mr. Stewart states the disease prevailed in the year 1823. What significance the absence of a true Hawaiian word for leprosy bears is such that this very absence in itself is almost sufficient evidence to prove that leprosy has not reached its present development by hereditary influence only, and that a very strong, helping hand has been offered by contagion, the period being too short for the influence of heredity to show itself.

I repeat, on no other grounds can the spread of leprosy be explained, in the Hawaiian Islands, than by regarding the disease as contagious,—not a theory of such, but a positive proof. Were the habits of the people different to what they now are, one might have some diffidence in arriving at this conclusion, but it is not so; here we have the best field for observation. In the carelessness of the natives, in disease generally, their hospitality to the leper, and contempt of the disease, there is also present here in these islands a typical illustration of the ominous remark of Dr. Tilbury Fox—such remark generally being accepted as correct—"that it is in those places where leprosy is on the increase that the freest intermingling of the leprous and non-leprous part of the community takes place." Could the opposite conclusion be arrived at, "that although in Hawaii free intercourse exists between the leprous and non-leprous," the disease does not spread, I emphatically say no. Any calm impartial observer must arrive, sooner or later, at the conclusion that the type of leprosy prevalent in these islands is contagious, whatever else may be related of it in other countries. Many cases, undoubtedly, present some striking peculiarities, giving some credence to the view that the disease is non-contagious; but on a more minute scrutiny such cases can be explained on the principles of analogy, and did such instances arise in the prevalence of a disease we have more accurate knowledge of, they would present but slight difficulties, these being one of the many peculiar traits of a specific disease like leprosy, which is also thoroughly honey-combed with pit-falls for the unwary.

I now wish to state, that because I conclude leprosy is contagious, I think that I am carrying conviction to the mind of any person, who may happen to read this report, my object is to state facts, and hence the truth must result. Did I wish to write a paper on the non-contagious nature of leprosy, I could do so at the expense of concealing most prominent facts bearing on the view that it is contagious; on the other hand, did I wish to prove leprosy contagious, I might conceal many facts proving it non-contagious. To avoid any prospect of being charged with wholly treating leprosy in its contagious aspect, whatever cases bear on the non-contagious view, I will give great prominence to and assign to them their relative importance.

I will now state my reasons for believing that leprosy is contagious.

1. Hereditariness, as the sole agent in the propagation of the disease, will not account for its rapid increase in these islands for the following reasons:

(a) Sterility amongst the leprous is much more frequent than fertility.

(b) The majority of the off-spring of leper parents, or parent, are still-born, or die within a short period after birth. The children born at the Settlement, during the past 15 months, amount to 5, and 2 out of these alone are now alive. And again, it is doubtful if these two remaining infants will reach adolescence, and even then they may illustrate the law of atavism, which frequently is applicable to leprosy.

(c) Even allowing lepers to be fertile, are not the Hawaiian race notoriously unprolific, and shall I ask the question, whether a healthy parent is more likely to be fertile than a leper? If fertility in a marked degree does not exist amongst the healthy, then it is hardly reasonable to conclude that it will exist to a greater degree amongst the leprous.

(d) Many children, the off-spring of known lepers, have not developed the disease in their lives, although most probably hereditary predisposition was present, but leprosy never developed.

That the influence of heredity might play an important role as the sole factor in the propagation of the disease did the lepers in these islands, only aggregate a few hundred since the disease was first definitely known I quite admit; but when the number of lepers reaches into thousands, I certainly think that another source for its spread must be sought than in the influence of heredity.

2. That, invariably, when no hereditary history of the disease is obtainable, I can always elicit the facts "that contact with a leper for long or short periods had existed." I do not think the importance of this evidence can be sufficiently overrated.

3. The evidence obtained from foreigners—victims of the

disease—and from the history of their own cases, lends strong support to the view that the disease is contagious. It is not rational, but absurd, to conclude that the foreigners who now have the disease, and those also who have had the disease (now deceased) acquired it in their respective countries. How does the hereditary theory affect them? In the majority of cases, not at all. (One man from the Mauritius brought the disease already developed when he landed).

4. Some weight must be attached to the views of these foreigners themselves. They, one and all, such as are now alive, emphatically declare their belief that the disease is contagious. Some give evidence of contact (immediately followed shortly by local symptoms—direct inoculation), infection of the whole system speedily following, this again succeeded by external manifestations of leprosy within a comparatively short period.

5. The history of Father Damien, who came here in the year 1873, to exercise his calling as Catholic priest, and who has, within the past two years, been afflicted with symptoms suspiciously resembling those of leprosy; since August, 1885, outward manifestations of tubercular leprosy have appeared, placing the diagnosis beyond all doubt. It will be discussed further on when dealing with the manner the "contagion" of leprosy enters the system. I may simply add, also, that Father Damien has always maintained that the disease was contagious; his continuous residence of thirteen years has afforded him plenty of facilities for giving this opinion on the matter.

6. My own observations, from a physician's stand-point, will be stated hereafter.

7. The opinions of other experienced and reliable physicians in these islands.

8. The failure to explain its spread amongst clean families (foreign) known to have had no tendency to the disease, otherwise than by regarding the disease in a contagious light.

9. The contagious character of leprosy can be borne out in every particular by the attitude the Hawaiians adopt towards lepers. To state briefly: "The lepers are welcomed in their midst with open arms." Were these conditions reversed, the state of affairs, socially fulfilling rigid seclusion and ostracism; then leprosy spreading to any extent, it would be necessary to seek other sources of spread than contagion supplies.

Under these latter conditions, I not deny that leprosy would exist, and there would also be strong evidence in favor of the disease being non-contagious. It is from this evidence also that we receive facts practically applying to those countries where we have reports of the disease being non-contagious. I will pit climate against climate, tropic against tropic, not tropic against tropic, and take India, where Dr. Macnamara remarks of the

natives: "That although lepers move about amongst their countrymen, they are, to a great extent, isolated from them. Who ever saw a healthy native touch, much less eat with, one affected with leprosy? In many parts of India the fact of admitting a leper to a general hospital is sufficient to drive away every other person out of it."

I now wish to offer a few remarks to illustrate the progress of disease at Kālawao and Kalaupapa amongst the kokuas, both male and female; these are cases that have been under my own observation, and have developed leprosy since my residence at the Settlement.

In the month of February, 1885, I made a medical inspection of all the kokuas residing at the Settlement; the result was as follows:

Total number male kokuas	91
" " female kokuas	87
Total.....	178

The male kokuas had mostly accompanied their wives, and the females their husbands. There were one or two cases where the father accompanied his son, and a mother her son or daughter, or aunt, nephew and niece. Be the relation what it may, all these healthy people were in contact with lepers continuously.

In the month of August, 1885, I made another inspection, and in a few weeks' time I purpose doing so again.

At the date of my writing this report (February 17, 1886), twelve months after my first systematic inspection of the kokuas, the state of affairs is as follows:

Number of male kokuas who have become lepers in the twelve months, February, 1885, to February, 1886, five. Female kokuas who have become lepers during the same period, twelve—male 5, female 12; total 17. Total number male and female kokuas, therefore, are 17. Excess of female over male, 7. So that out of a total of 178 healthy people in twelve months, 9.5 per cent. have developed leprosy. Then, at the same rate of progress in twenty years, all these people will be lepers. But this is not borne out absolutely, for many Hawaiians live here year after year, marry lepers again and again, and show no external manifestation of the disease. These latter cases are not the majority, but a small minority, and bear evidence that leprosy is not contagious to every person. Many persons will say these people have it in their system. Undoubtedly this is correct in many instances which I know of, and could cite; but, whatever may be said to the contrary, I assert that a small minority of the Hawaiian race are positively exempt from the disease.

NON-CONTAGION.—From what I have just written it is evident.

I hold the opinion that leprosy is not contagious to everybody. This is the case, and there is nothing remarkable in the statement. Did everybody who comes in contact with our well-known contagious and infectious diseases,—small-pox, scarlet fever, measles, typhus, etc.,—get each of them respectively, it would be a very dismal prospect for nurses and physicians, and other attendants. I simply assert that many persons have an immunity conferred on them. What confers this special immunity is now foreign to my purpose to enter upon, but it is the generally received explanation, and I assert that the small number of cases that go to prove leprosy non-contagious fall within this special sphere of immunity.

When I see daily and hourly before my eyes a man who tells me he is perfectly well, looks well, and I conclude he is, after a medical inspection, and after these preliminaries I come to inquire into his history, and he states as follows: "I have had one, two, frequently three, and sometimes four, leper wives, and my children have died from leprosy, and I have lived here 10 years in contact with all the lepers,"—after such a story as this it would be quite reasonable to conclude that leprosy is certainly not contagious to everybody—it is not a question of degree of contagion, but non-contagion.

Again, when a woman repeats in substance such a story as the foregoing, and after all this contact and exposure, is to outward appearance healthy, one would be justified in concluding that the disease was non-contagious, certainly to this individual woman.

To illustrate further: The washer-woman for the hospital at Kalawao, has washed the soiled clothes of the worst cases, certainly many of them so, in the Settlement, for the past seventeen years. Any one who has seen advanced cases of tubercular leprosy knows the condition this soiled linen will present; nor is this her only contact with the disease, she has lepers living in her house, and, to crown all, her husbands, two in number, were lepers for years before they died; and yet, in spite of all this contact, this said woman to-day is hale, hearty and plump, and as fine a specimen of womanhood as any in the islands; her age is now 46 years.

But are these cases the rule? Certainly not, they make up a small minority in comparison with those who would have become lepers under the same exposure, and do become lepers.

These cases number, at the Settlement,

Males	26
Females	22
Total.....	48

These 48 cases give an average of 15 years each of close and intimate contact. That some will become lepers I am certain;

that others will resist all infection I am also positively certain. These are the accumulated resisters of the disease for years. One woman has lived here 19 years.

I have already shown the number of kokūas that did develop leprosy last year, viz., 17. If the disease develops at the same rate, in three years time the contagious cases will have passed the non-contagious, taking the same figures; and yet these 48 are the accumulated veterans of the Settlement. What a speck, verily! A mere drop in the ocean of the contagious cases.

I have not had leisure enough to collect all my figures, but will give the results that I arrived at, not absolutely accurate, but sufficiently so to illustrate my point.

If one hundred Hawaiians, sexes mixed, have continuous contact with leprosy for a period of years, say 5 to 15, at the expiration of that period no less than 82 would have become lepers, the remaining 18 would be clean; and these latter are the class who are illustrations of leprosy being non-contagious—not in a group, but scattered, here and there, through the vast number of contagious cases.

As an island in the ocean is generally a striking object to vision, so is an isolated case of non-contagion; and, also, as a vast continent is not exposed to view at one time, so cases of contagion are not presented in an unbroken series.

From the means at my disposal here, I have come to the conclusion that about 18 per cent. of the Hawaiian race resist the contagion of leprosy, quite a sufficient number, however, to be put in a separate division, but not a sufficient quantity to warrant a conclusion being arrived at that leprosy is a non-contagious disease.

HEREDITARY PREDISPOSITION—As an agent in causing the spread and perpetuation of leprosy, occupies a most important position. In these islands, I will place its relative rank next to contagion, giving the latter the position of chief factor at work spreading the disease in this country.

Having before stated, "that, in my opinion, leprosy was introduced here only since the advent of the foreigners," hereditary predisposition has not had opportunity to prove sufficiently the extent of its power; that it can approach its ally, contagion, is not to be thought of, owing to the unprocreativeness of the present Hawaiian race, and how hereditariness in leprosy should or could have been elevated to the first rank of propagator of the disease in these islands I am at a loss to understand.

Predisposition is a name applicable to very few diseases, the best exponent being found in leprosy; syphilis is quite erroneously placed under this heading.

I may here remark that no child born at the Settlement since my period of residence has had manifestations outwardly of

leprosy at birth. The causes, so far, that I have mentioned in connection with the spread of leprosy in the Hawaiian Islands are: First, contagion; second, hereditary predisposition. The third cause to which I attach some importance, and which has undoubtedly spread the disease is vaccination.

I can bring forward no case personally, but I have reliable hearsay evidence that after the operation of vaccination had been performed on several white children they manifested signs of leprosy, and finally developed the disease. Evidence on this same point is put forward by Sir Ronald Martin, in India, and by Professor H. G. Pittard, of New York, both reliable authorities. The possibility of such an occurrence again taking place, "now that bovine virus only is used in the operation" by the medical officers of the Hawaiian Government, is most improbable.

The extent to which each of the following factors are responsible for spreading leprosy, these factors being contagion, heredity, and vaccination, are as follows:

Contagion.....	70 per cent.
Heredity.....	28 " "
Vaccination	2 " "

I have personal knowledge of the two first, which account for almost all cases. Some few cases not coming under either heading, I have placed under vaccination, as being the most feasible situation for them, as in the Hawaiian Islands I recognize no other agents at work, such as we hear of in Norway, India, etc., where no doubt the disease has some obscure origin. In these islands no such origin need be sought for, the disease being introduced.

CONTAGIUM.—It is not my intention to enter at length on this subject, except in so far as it trenches on the domain of leprosy.

By the "Contagium of Leprosy," I wish to convey "that supposed specific material in which the infective power ultimately resides," and here I only purpose dealing with this question, in so far as the contagium of leprosy enters the body, viewed from my own stand-point. The absolute certainty of my views I wish no one to accept, as by asking or thinking this would be done I lay myself open to be charged with dogmatism.

I believe that the "contagium" of leprosy enters the system by—

1. INOCULATION.—

- (a) At broken surfaces of the skin.
- (b) At broken surfaces, fissures or chaps, on external mucous surfaces.
- (c) Possibly by punctures of insects, or the presence of parasites, scabies, etc.

2. INHALATION.

Under division 1 many cases bearing out the view that

leprosy is thus spread have come under my notice. I will relate the salient points only. A man tells me that after direct contact with a female he became aware of a small sore on a certain part of his person; this said sore not healing, he applied to a physician and was treated for syphilis; no direct benefit ensuing, he went to another physician, the result being the same, meantime he felt generally ill. Then, later on, spots appeared on his body, and his eyebrows began to diminish; finally, he went to a third physician, and was told he had leprosy. There are many such cases here at Kalawao amongst reliable narrators who could not convey a more impressive story. The female at the time not manifesting signs outwardly of leprosy, but afterwards has done so. Such cases are well known to many laymen and professional men as correct, and have laid a well-founded base on which to establish leprosy as an inoculable disease.

DIVISION 2—INHALATION: An act comparable to inoculation on external surfaces take place on internal surfaces. This is my illustration: When particles conveyed in the exhalations given off from a leper (especially in the tubercular cases attended with general ulceration) are inhaled, these presumed contagium particles are caught on the tonsils, or are carried into the bronchi, or swallowed into the stomach. They begin by penetrating the texture of the mucous membrane, "and thus effect as genuine an inoculation, with regard to the blood, as that which art or accident provides in other cases through the punctured skin."—(J. Simon).

By the first means (inoculation) many cases of leprosy are propagated, but I do not think it is nearly so frequent as by inhalation. Under this latter heading I would place the case of Father Damien, whose history I briefly relate.

Father Damien arrived at the Settlement in the year 1873, and has lived there continuously ever since. He is a Belgian, of good physique, and when he arrived was 34 years of age. During all the period of his residence he has been daily and hourly in contact with lepers of various grades, many very severe. Until 1884 he felt fairly well. In that year pains in the left foot troubled him; these continued to get worse, and, in the absence of any other signs, were attributed to rheumatism. Towards the end of the year 1884 he consulted Dr. Arning (a physician who is making leprosy a special study), and to this gentleman must be given the credit of diagnosing the disease in its very early stage, as certainly not until six months afterwards did external manifestations of leprosy develope. This was Dr. Arning's diagnosis, the symptoms pointing to deposit of leprous matter in the structures connected with the peroneal nerve in the flexure of the knee. In May, 1885, there were no striking changes in his face when examined by Dr. Arning and myself. In August, 1885, a

small leprous tubercle manifested itself on the lobe of the right ear, and, from that date to the present, diminution and loss of eyebrows; infiltration of the integument over the forehead and cheeks is slowly, but certainly, going on, so that the case of Father Damien is a confirmed tubercular one, the symptoms and signs now present placing it in that class.

I believe the majority of cases of leprosy at the Settlement, had they been rigidly watched, would fall in the same category as Father Damien's. Most cases of leprosy are recorded between the ages of 30 to 50 years, so heredity is scarcely possible.

I am also clearly of opinion that leprosy is contagious at the beginning, and all through its course, and that the "exhalations" from the leper are the main agencies at work.

Women are less liable than men to the disease, I believe, owing to physiological causes peculiar to the sex; and, I explain, the many cases related of certain women having 2 or 3 husbands, and although previously clean, falling victims to leprosy, the woman herself remaining unscathed on these physiological grounds, which, when a certain age is reached and changes occur in the system—resulting in the cessation of menstruation—leprosy, which may have been dormant, proceeds to show itself.

One other point I wish to allude to, and that is that I have not met with an intermixing of cases of Tubercular and Anæsthetic Leprosy in the same family. The variety is Tubercular alone, or it is Anæsthetic alone.

My opinion as to whether I think leprosy and syphilis are homologous, is asked, and whether one disease has any connection with the other.

There is no homology between leprosy and syphilis, in my opinion, but there is an analogy. Of all the other constitutional diseases I do not think any are allied so closely as leprosy and syphilis; but they are distinct diseases. Leprosy is *sui generis*, syphilis is *sui generis*. If it were not so then the specific remedies we have for syphilis would act on leprosy also, but they do not.

To conclude this. I affirm that any observer or physician, who has studied Visceral Syphilis, will speedily see where the diseases agree, and where they do not; and those who only observe the external manifestations of syphilis will flounder among the many pit-falls which appear when least expected.

Treatment.—This is the briefest question of any to deal with, but the most disheartening to a physician, as so far no remedy has been found beneficial in each individual case.

At the Leper Settlement I have made no attempt to carry out specific treatment, except in a few cases, as most of the cases are advanced, and the internal organs I knew would be affected,

and therefore the attempt quite hopeless. I may add, that even had I wished it, I would have found difficulty in getting patients to take medicine, especially as they had been deluged with medicine without result,—with improvement for a time, then retrogression. Again, it is well known that the Hawaiian people do not approve, on the whole, of foreign medicines. I have treated the cases that fell under my charge, generally, for complications of the disease, which certainly admit of relief, these are coughs, diarrhoea, fever, anasarca, ascites, necrosis, caries of bones and teeth, stomatitis, iritis, etc. Scabies, I regret to say, prevails largely, but as soon as I can get a system of baths, I intend pursuing a vigorous course.

For the various complications enumerated above, each applied to its special ailment, I find Quinine, Salicylate Soda, Jaborandi, Squills, Senega, Ipecacuanha, Morphia, Chloroform, Amyl Nitrite, Acetate Potash, Iron, Digitalis, Ladechu. Bismuth, Sulphuric Acid, Nitric Acid, etc., all valuable. * Externally, for ulcers, there is no remedy equal to Iodoform, then Resin Ointment, Tinct. Benz. Co., Tinc. Ointment, Salicylic Acid Ointment, Carbolic Acid, Nitrate Silver, etc. Gurgun oil, as a specific remedy, I am trying, and would extend its use, had I means to carry on a system of bathing.

Chaulmoogra oil I hope to give a trial to shortly, to determine its value also, and that of Gurgun oil, if any; although inwardly, I have almost made up my mind before-hand as to the effect they will have.

So far, owing to the advanced stage of the disease existing in most of the lepers here, my main treatment has been "palliative" only.

Surgery affords a large field for work, but is mostly unavailable, owing to its being held in disfavor, somewhat akin to fear; however, I do receive a few cases. This is encouraging.

With respect to "the action or effect on the disease of alcohol and opium," I regret being unable to enter upon either of these questions, with the prospect of stating my own personal experience. With these remarks I bring my report to a close, regretting my inability to deal more adequately with many of the questions asked of me.

I have the honor to remain,

Your obedient servant,

ARTHUR MOURITZ,

Physician to the Leper Settlement.

KALAWAO, Molokai, Feb. 17, 1886.

APPENDIX L.

REPORT OF DR. MOURITZ FOR THE BIENNIAL PERIOD OF 1884-1886.

His Excellency W. M. GIBSON,
President of the Board of Health.

SIR:—In accordance with your request, I have the honor to submit the following report on the Leper Settlement at Molokai, for the biennial period ending this day.

By Your Excellency's instructions, I undertook the medical supervision of the Settlement in the early part of the month of November, 1884, and from that date have acted as its sole physician.

On a prior visit, made shortly before my accepting the position as physician, I had viewed the Settlement from a medical stand-point, and found much to commend, taking into account the brief period Hawaii has entered the arena of civilization. A few minor matters, however, appeared to require rectification and possible improvement. These will now be briefly dealt with.

Soon after I had taken up my residence here, I thought it desirable to make greater facilities for obtaining medicines. Previously all supplies had been obtainable at Kalawao only. At Kalaupapa, therefore, some two and a half miles distant, I opened a dispensary in December, 1884, separate and independent of Kalawao, and judging from the number who apply for medicines and medical treatment, its establishment has proved that it meets a want.

In the hospital at Kalawao I also placed a supply of medicines, prepared for immediate dispensing, and suitable to the requirements of the most common ailments, together with instructions sufficiently explicit and simple that any person of average intelligence could master them.

When I am absent from the Settlement, I leave this supply in the charge of a Hawaiian, and have every reason to be satisfied with the manner in which he discharges his duties.

The cottage at Kalawao, which contained the dispensary, I saw fit to have moved to a more accessible and convenient situation, both for the residents and water supply. This having been accomplished, its present site meets all requirements.

These three slight alterations were the only ones which appeared to me necessary in the external medical administration.

That many glaring defects do now exist in the medical administration, no one is more conscious than I am. Some of these shortcomings I am gradually improving; others do not altogether lie in my power to eradicate.

I also thought it desirable to make a general clinical inspection of all healthy persons, resident at the settlement, coming within the jurisdiction of the Board of Health, within such periods as appeared requisite.

The other matters I purpose dealing with in this report, will come under the following headings:

1. Medical treatment, etc.
2. Food.
3. Leprosy (remarking on change of type).
4. Present requirements of the Settlement.

MEDICAL TREATMENT, ETC.

The majority of the cases of leprosy here, being confirmed, I have not thought it desirable to make any attempt to carry out systematic treatment, with a view to cure the disease. Palliation, of the various complications present, has been my chief endeavor. In some instances I have succeeded; in others, without any good result accruing.

The various eye troubles, not directly amenable to treatment, have been improved, and the sight materially preserved by protectors, preventing direct access of wind, dust and bright light. I have distributed nearly 200 eye protectors to those lepers whom I judged would be benefited thereby.

I may here remark that the prevailing weather materially influences the course of the various complications of leprosy, notably, when the respiratory tract is much affected. Damp, cold days invariably carry off those who otherwise might have lasted for a brief period, under more genial atmospheric conditions.

The Hawaiian leper presents the same good temper and genial disposition as his healthy compatriot, and, in so far as my work as a physician lies amongst the former, they cause me very little trouble. For the numerous and troublesome complications of leprosy, I have applicants daily, asking medical relief, and many of these sufferers have more than one complication active at the same period. Amongst these cases are found some who, from previous experience of what they think suits them best, prescribe for themselves. I allow this, for if I directly refuse, they decline any other medicine. At the same time, I do not always give what I am asked for; many medicines, fortunately, appearing alike, I have opportunity to substitute what I think most suitable. On the other hand, a minority of applicants ask me

what is most suitable for their cases, and thereby I am at liberty to use my professional judgment.

Indicative of the present health of the lepers, I may remark that, when I was taking a census in the third week of this present month, and obtaining the requisite information by personal house to house visitation, out of a total of over 652 lepers I only found six who were seriously ill, and confined to their homes.

I here desire to record my appreciation of the liberal manner the Board allows me to order and supply my various demands for drugs and medical appliances, especially in the absence of medical representatives from the Sanitary Committee, is this trust creditable.

The expenses of drugs and medical appliances, etc., amount to the sum of \$1,120 20 for the past sixteen months—the time I have held office.

FOOD.

In the month of July, 1885, complaint was made to me by the lepers residing in the Hospital of the quality of the food supplied to them. The statement was universal "that the poi had a pungent, disagreeable taste," the effect of this being to cause nausea, or vomiting. On investigation, I considered the complaint was justifiable, and I therefore notified the resident Deputy Superintendent, and he rectified the trouble by issuing a fresh supply of paiai. The cause of the deterioration in the quality of the poi was traceable to the detention of the paiai on board a steamer for a period of five days previous to being landed at Kalaupapa. In this instance the supply of good and wholesome food by the Board of Health was frustrated by the occurrence mentioned. Whether the present diet supplied to the lepers here is suitable in all respects may be answered in the affirmative, and that this is a safe conclusion to arrive at, I think, is evident for two reasons :

1. The absence of general complaint.
2. The incurability of the disease, and its duration here amongst those the subjects of it, compared with other countries where the disease is endemic.

Whatever may be said about other diseases being materially influenced for the better by special diet, I think it must be admitted that leprosy, being hitherto incurable, and until more convincing evidence is adduced of the supposed disadvantages connected with certain diets, the leper may be safely allowed to consult his own inclination, especially in these islands, where the staple food of the aborigines has been almost wholly confined to poi and fish for centuries, and which alone satisfies them.

On the vexed question, which has been brought forward here, of "Whether the exclusive use of certain foods is the chief etio-

logical factor spreading leprosy in these islands?" I think the evidence bearing on this point very soon compels those who have paid any attention to the true investigation to conclude that leprosy is much too subtle and specific a malady to be influenced by dietetic regimen, except in so far as grave departures from the usual well recognized standards are indulged in. These remarks are quite as applicable to all morbid states as to leprosy. The role, therefore, that diet plays in producing leprosy in these islands is, in my opinion, nil.

I here beg to offer a few remarks on what a most valuable addition milk is to the present diet, supplied by the Board of Health to lepers; but this article, as now served out, is too meagre in quantity, and I would recommend that an increased supply be provided, and greater facilities be afforded for distribution. This can be easily accomplished at a merely nominal cost, with the material at present at the command of the Board of Health.

LEPROSY—(Remarking on the possible change of type):

The total number of lepers residing at the settlement to-day amounts to 652, comprising both sexes and all ages. This total is made up of 333 tubercular cases, 204 anæsthetic cases; the remainder, the mixed cases (115), make up the balance. On interrogating intelligent natives and foreigners resident here for the past five years and more, they invariably agree in stating that the tubercular form of leprosy bears a much smaller proportion to the anæsthetic than it did when they arrived at the Settlement. On seeking further confirmation amongst the written records, I found evidence agreeing with the correctness of the statement, "that the tubercular leprosy is not as prevalent a form of the disease as it was some years previously." I am, therefore, inclined to conclude that leprosy is gradually undergoing a change of type, and this of a more conservative nature.

Tubercular leprosy may be termed "Rapidly progressive, or most active." Mixed leprosy (the connecting link between tubercular and anæsthetic) may be also termed "Less rapidly progressive, or moderately active." Anæsthetic leprosy is the "Least rapidly progressive, or active," and empinges on the term conservative. I may here mention that I have heard the opinion expressed by many able physicians in Europe that, although leprosy does not now exist, yet amongst the inhabitants of those countries where it prevailed until a recent date, various obscure nervous affections occur from time to time which are most probably lingering relics of anæsthetic leprosy. The connection of this statement with what I have mentioned on the relative prevalency of the forms, now present in the Settlement, is one of importance, and further investigation of this matter will repay the time spent in doing so.

THE CHIEF REQUIREMENTS OF THE SETTLEMENT.

These are—First: Convenient and properly constructed baths and wash-houses, supplied with hot and cold water, and also furnished with suitable appliances for personal ablution and cleaning of clothes. With these powerful auxiliaries, there might be some possibility of eradicating one of the greatest banes of the Settlement, viz., Scabies. From the measures used now to deal with this troublesome affection, and in use in the past, to expect a successful result is not to be thought of.

Secondly: Not quite so needful as the above, but which would be highly advantageous to have supplied, are thirty iron single bedsteads for the hospital to replace the wooden bed supports now in use, which are worn out and harbor vermin, with consequent annoyance to the occupants of the beds. A separate basin and jug for each patient would also be a desideratum.

In this connection I hope that all those Hawaiian representatives elected to the Legislature of 1886 (who may by chance read this report, and who have, or profess to have, any feelings of commiseration for their fellow countrymen and women now in exile here as lepers), will endeavor to obtain the appropriation of sufficient funds to enable the Board of Health to carry out these truly necessary requirements in as efficient a manner as is possible, which will much conduce to the comfort of their afflicted fellow countrymen.

Appended to this report will be found tabulated statements showing various information connected with the Leper Settlement for the biennial period ending March 31, 1886:

Table A—Showing arrivals, sex, nationality, and previous residence (island).

Table B—Census taken personally, completed on March 17th, 1886, and corrected to date, showing number of lepers, ages, sex, and nationality.

Table C—The date of arrival at the Settlement, or entry on the leper list, of all lepers now alive, and sex.

Table D—The quota of lepers, now alive, furnished by each district of the several islands, with their place of residence at the Leper Reservation.

Table E—Various items, Mortality of past biennial periods, Discharges, etc.

Table F—Monthly mortality, sex.

Table G—The year of arrival of those who have died, and the number who have died in the past biennial period belonging to these respective years.

On reviewing Table D, Maui will be noticed to furnish more lepers relatively to its population than any of the other islands. This result coincides with the statements contained in my special report to Your Excellency.

In concluding this report, I beg to tender my thanks to the Board of Health for their courteous and speedy compliance with my request for improved house accommodation, befitting the comfort of a resident physician.

I have the honor to remain,

Your Excellency's obedient servant,

ARTHUR A. MOURITZ,

Physician to the Leper Settlement, and Island of Molokai.

Kalawao, March 31, 1886.

One or two items not included in the following tables, I here state in brief form, of the total number of lepers in the Settlement this day:

333	Suffer from tubercular leprosy
204	" " anæsthetic leprosy
115	" " mixed form of leprosy.

652

Again, in degree of progress, 254 are advanced
174 are moderate
224 are slight cases.

652

The number of couples married, or who live as such, sum up '87.

Of a total of twenty-six children born in the Settlement, who vary in age from 3 years to 14, nine up to this date are lepers: the remaining seventeen show no outward manifestations of the disease so far.

Included in the mortality figures, Table F, for the year 1884-85, are two Chinese and four males of mixed Hawaiian blood. Also, in the same Table F for the year 1885-86, three males and two females of mixed Hawaiian blood are included.

In connection with Table G, all lepers segregated in the years 1869, 1868, 1867, and 1866 are dead. The last survivor, a female, of the lepers who arrived here in 1866 died in February, 1884; and of those lepers who arrived in 1869 the last survivor, a male, died in October, 1878.

TABLE A.—1.

Number of lepers received during the past biennial period, or entered on the list here.

Year.	Hawaiian.		Mixed H.	Chinese.	German.	Belgian.	Pole.	Guam.	Total.
	M.	F.	M.						
1884-85..	68	36	1	5	0	0	1	0	111
1885-86..	48	24	2	1	1	1	0	1	78
Total..	116	60	3	6	1	1	1	1	189

TABLE A.—2.

Showing the number of lepers received from the various Islands, Hawaiians only.

Year.	Hawaii.	Mau.	Oahu.	Kauai.	Molokai.	Total.
1884-85.....	31	24	23	11	15	104
1885-86.....	15	13	8	7	29	72
Total.....	46	37	31	18	44	176

TABLE B.—Census of Lepers.

Ages.	Hawaiian.		Mixed Haw'n.		Ch'se.	Germ'n	Brit'h	Pole	Bel'n	G'am.	Total
	M	F	M	F							
1 to 10 yrs..	11	6	0	0	0	0	0	0	0	0	17
10 to 20 yrs..	75	45	4	0	0	9	0	0	0	0	124
20 to 30 yrs..	82	38	5	0	9	0	1	0	0	0	135
30 to 40 yrs..	77	34	3	1	4	0	0	0	0	1	120
40 to 50 yrs..	54	50	1	0	3	1	1	1	1	0	112
50 to 60 yrs..	56	33	0	0	3	2	0	0	0	0	94
Over 60 yrs..	32	18	0	0	0	0	0	0	0	0	50
Total.....	387	224	13	1	19	3	2	1	1	1	652

TABLE C.

Showing the year of entry on the leper list of all lepers now alive, and sex.

Year.	Males.	Females.	Total No. Alive.
1870	3	3	6
1871	3	2	5
1872	5	3	8
1873	10	4	14
1874	4	4	8
1875	10	6	16
1876	5	0	5
1877	9	4	13
1878	14	13	27
1879	22	15	37
1880	27	14	41
1881	32	19	51
1882	42	18	60
1883	94	55	149
1884	67	26	93
1885	64	32	96
1886	16	7	23
	427	225	652

TABLE D.

The quota of lepers now alive, from each District of the several Islands. Hawaiians only.

Island and Districts.	Kalawao.	Makanalua.	Kalaupapa.	Iliopi.	Total.
HAWAII.					
Kohala	25	2	17	2	46
Kona	21	4	18	1	44
Kau	9	1	4	3	17
Puna	6	0	1	0	7
Hilo	18	2	22	3	45
Hamakua	12	1	13	1	27
	91	10	75	10	186
MAUI.					
Kona	24	1	7	1	33
Wailuku	34	6	18	0	58
Makawao	10	12	13	0	35
Hamakua	0	0	13	1	14
Hana and Koolau ..	12	1	19	2	34
Kahikinui	11	1	6	0	18
	91	21	76	4	192
OAHU.					
Kona	55	3	45	10	113
Ewa & Waianae ...	4	1	8	2	15
Wailua	8	0	1	0	9
Koolauloa	0	0	1	0	1
Koolaupoko	7	0	11	0	18
	74	4	66	12	156
KAUAI.					
Puna	7	1	8	0	16
Halalea	2	0	2	2	6
Koolau	9	1	3	4	17
Kona and Niihau ..	2	0	7	1	10
	20	2	20	7	49
Molokai	11	2	13	2	28
Total	287	39	250	35	611

TABLE E.

Table reviewing for the whole period the leper segregation, etc., on Molokai.

Biennial year.	Arrivals.	Discharged.	Deaths.	Biennial Deaths.	Total
1866-7.....	141	10	26	32	
1867-8.....	70	7	25	27—	59
1868-9.....	115	2	28	35	
1869-70.....	126	11	59	57—	92
1870-1.....	57	4	58	54	
1871-2.....	183	9	61	59—	113
1872-3.....	105	4	64	69	
1873-4.....	487	21	156	174—	243
1874-5.....	91	8	161	145	
1875-6.....	212	14	163	167—	312
1876-7.....	96	3	122	113	
1877-8.....	163	1	129	148—	261
1878-9.....	239	0	147	174	
1879-80.....	125	1	209	178—	352
1880-1.....	51	10	152	152	
1881-2.....	232	0	132	126—	278
1882-3.....	71	13	121	130	
1883-4.....	301	10	150	184—	314
1884-5.....	108	7	168	138	
1885-6.....	103	25	142	121—	259
1886.....	23	0	20		
Total.....	3099	160	2283	2283	2283

Total number of lepers received..... 3,099

Total number discharged and died..... 2,443

Total number remaining..... 656

By my census number of lepers this date..... 652

Number unaccounted for..... 4

TABLE F.

Table showing mortality for the past biennial period.

Month.	1884 and 1885.			1885 and 1886.		
	Male.	Female.	Total.	Male.	Female.	Total.
April.....	8	9	17	3	9	12
May.....	8	9	17.	6	7	13
June.....	4	6	10	8	9	17
July.....	9	4	13	8	5	13
August.....	3	2	5	4	3	7
September....	5	6	11	5	0	5
October.....	4	3	7	9	2	11
November....	4	3	7	7	4	11
December....	6	4	10	9	3	12
January.....	13	4	17	6	4	10
February.....	3	8	11	4	2	6
March.....	8	5	13	2	2	4
Total.....	75	63	138	71	50	121

Grand total for biennial period. 259

TABLE G.

Showing the year of arrival and the number belonging to the several years who have died during the past biennial period.

Year of arrival.	1884-85.	1885-86.	Total.
1872	1	1	2
1873	8	1	9
1874	1	2	3
1875	5	1	6
1876	5	6	11
1877	5	7	12
1878	19	11	30
1879	14	6	20
1880	2	4	6
1881	32	20	52
1882	11	5	16
1883	31	39	70
1884	4	11	15
1885	0	7	7
Total.....	138	121	259

MANAWAI, MOLOKAI, March 27, 1886.

His Excellency W. M. GIBSON,

President of the Board of Health.

SIR:—At the time of my undertaking the position of Resident Physician for the Leper Settlement, Your Excellency having notified me "that it would be desirable to make my services available, to some extent, for the people resident on the Kona side of this island," which, in so far as the population is concerned, extends from Kaunakakai to Halawa, I therefore have endeavored to place some portion of my time at the disposal of the inhabitants residing on the leeward side for the past four months, opportunity to do so earlier not having presented itself. I find here the natives very pleasant to deal with, and, in so far as the short time at my disposal has allowed me to observe, they pay more attention to following out the treatment of a foreign physician; I judge this from the numbers who apply continuously for the relief of many ailments, some quite incurable. Payment has been offered to me for my services both by those who I judged could afford, and those who could not afford to do so: in all instances I have declined remuneration. Whether a small payment should be required sufficient to cover the cost of the medicine supplied to each applicant is a difficult matter to decide; at the same time, I think it advisable some conclusion should be arrived at. The wholesale pauperization of the Hawaiian community is not a very desirable light to view the matter in, yet this is really the state of affairs all over the group, where no fee is demanded for medical services. I think this matter should receive the attention of the Legislature. If a man is supplied with medicine gratis, why not with food and clothes, which are more necessary for the maintenance of health?

In the month of February last an epidemic prevailed here, of which diarrhœa was the prominent feature. On observing the course of some of these cases for a few days, I was led to suspect they were hybrid forms of typhoid fever, the type being mild; some cases died, but the majority recovered. Sporadic cases continue to occur from time to time.

I have ascertained that this "mai hi," so called, has occurred at similar seasons yearly, the prevailing atmospheric conditions appearing to exercise some influence.

No other sanitary matters call for comment.

I have the honor to remain,

Your Excellency's obedient servant,

ARTHUR MOURITZ,

Physician to the Leper Settlement and Island of Molokai.

APPENDIX M.

SPECIAL REPORT FROM REV. J. DAMIEN, CATHOLIC
PRIEST AT KALAWAO, MARCH, 1886.

*A Personal Experience of Thirteen Years' Residence and Labor
among the Lepers at Kalawao.*

KALAWAO, March 11, 1886.

To His Excellency WALTER M. GIBSON,
President of the Board of Health.

DEAR SIR:—I herewith enclose the report on my observations and action at the Leper Settlement during a residence of thirteen years, which Your Excellency requested me to prepare. Hoping that it will meet your views,

I remain Your Excellency's most humble servant,
J. DAMIEN, Catholic Priest.

By special providence of Our Divine Lord, who, during His public life showed a particular sympathy for the lepers, my way was traced towards Kalawao in May, A. D. 1873. I was then 33 years of age, enjoying a robust, good health—Lunalilo being at that time King of the Hawaiian Islands, and His Excellency E. O. Hall President of the Board of Health.

A great many lepers had lately arrived from the different islands; they numbered 816. Some of them were old acquaintances of mine from Hawaii, where I was previously stationed as a missionary priest; to the majority I was a stranger.

The Kalaupapa landing-place was at that time a somewhat deserted village of three or four wooden cottages and a few old grass houses. The lepers were allowed to go there only on the days when a vessel arrived; they were all living at Kalawao—about eighty of them in the hospital, in the same buildings we see there to-day. All the other lepers, with a very few kokuas (helpers), had taken their abode further up towards the valley. They had cut down the old pandanus, or pūhala groves, to build their houses, though a great many had nothing but

branches of castor oil trees with which to construct their small shelters. These frail frames were covered with ki leaves (*Dracæna terminalis*), or with sugar-cane leaves—the best ones with pili grass. I myself was sheltered during several weeks under the single pandanus tree, which is preserved up to the present in the churchyard. Under such primitive roofs were living pell-mell, without distinction of ages or sex, old or new cases, all more or less strangers one to another, those unfortunate outcasts of society. They passed their time with playing cards, hula (native dances), drinking fermented ki-root beer, home-made alcohol, and with the sequels of all this. Their clothes were far from being clean and decent on account of the scarcity of water, which had to be brought at that time from a great distance.

The smell of their filth, mixed with exhalation of their sores, was simply disgusting and unbearable to a new-comer. Many a time, in fulfilling my priestly duty at their domiciles, I have been compelled not only to close my nostrils, but to run outside to breathe fresh air. To protect my legs from a peculiar itching which I usually experienced every evening after my visiting them, I had to beg a friend of mine to send me a pair of heavy boots. As an antidote to counteract the bad smell, I made myself accustomed to the use of tobacco, whereupon the smell of the pipe preserved me somewhat from carrying in my clothes the obnoxious odor of the lepers. At that time the progress of the disease was fearful, and the rate of mortality very high.

These are a few of my recollections of what I have seen and experienced at the beginning of my labor here. The miserable condition of the Settlement at that time gave it the name of a living graveyard, which name I am happy to state, and hope to prove hereafter, is to-day no longer applicable to our place.

From the accession of King Kalakaua to the Throne up to the present time, His Majesty's Government, assisted by Christian charity, has endeavored, little by little, according to means and circumstances, to improve the situation of the lepers, and to make them more comfortable. •

Consulting my own observations and experiences only, without any memorandum book or register, I intend to show here what contributes much towards the comforts and benefits of lepers, and what is obnoxious or injurious to them, and will prove these two statements by putting our good situation and comfort in parallel with what I found here at my arrival, as already explained.

THE DIET OF THE LEPERS.

The food on which a leper has to live exercises a great influence on the disease. Our Hawaiian taro, containing a great quantity of starch, and being easy of digestion, is our best vegetable. So far, I have never seen any bad effects from it,

even in fevers and other temporary ailments to which our lepers are so often subjected to. Hawaiian people in general, but especially our lepers, cannot go well without it. I remember that, some ten years ago, the place having been about three months without taro on account of the scarcity of that vegetable, several deaths occurred in consequence of it, and the majority of the people looked emaciated, although they had plenty of rice and sweet potatoes.

The administration having to supply weekly from six to seven hundred people, each with twenty-one pounds of cooked taro, a few words concerning the manner how it is obtained may be desirable.

At the northern side of Molokai are three large valleys, viz., Halawa, Wailau, and Pelekunu, in which the cultivation of taro is the chief business of a considerable number of natives. On them especially we have to rely for our regular supply. The high cliffs preventing all overland road traffic, the cooked taro, or paiai, has to be brought by sea either in open boats or a small schooner, as was done from the beginning, or in a small steamer latterly.

The steamer's service has been highly appreciated by the public on account of its regularity, schooners and boats being often prevented by calm or rough weather from arriving when the food is wanted; unavoidably, our people are then deprived of their good poi, which is left to rot where it was cooked, causing great loss to all concerned. If poi cannot be obtained, the issue of rice or hard bread takes its place, of which there is always a certain quantity on hand, though it is recognized that, with the exception of the Chinese, neither native nor foreigner could live on rice as principal food.

A certain number of our people, with their more or less mutilated hands, succeed in raising a few sweet potatoes, which answer well for a change in the diet, or in case of emergency. Unfortunately some of our Hawaiians are much addicted to the use of a certain beverage made of sweet potatoes, which they allow to ferment, and thus obtain an obnoxious, intoxicating drink. They are very fond of it, but it makes them excited, and has a bad effect on their system, as have all other alcohols; and I wish to express here my sincere thanks to our local administration for having wisely prohibited the use of it.

Besides their regular food, a pint of good milk provides them advantageously with a wholesome, nourishing beverage in the line of diet. The question naturally occurs to the mind of the reader how can a sufficient quantity of milk to supply such a number of people be procured? May I be allowed to explain my views on this:

This Settlement, in the greatest part, affording the best kind of grazing for stock, I would suggest to the administration with

all my might to increase as much as possible the number of good milch cows. Unfortunately, on account of the great amount of meat wanted, about five thousand pounds a week, and the frequent failure of the arrival at the regular time of beef-cattle, our butchers are sometimes obliged to kill off more or less of our valuable milk stock, which keeps the latter on a decrease, and therefore lessens terribly the supply of milk.

Let me regretfully state, it is now several years, up to the present day, that not one-tenth of our lepers outside of the hospital yard have been enabled to enjoy the benefit of a small daily supply of milk.

I beg leave to be allowed to make here a suggestion for the benefit of the Board of Health and for the lepers. May it be proposed at the next Legislature to make, besides the regular appropriation for the support of the lepers, an additional one, such as to provide the necessary means for buying at once as many head of cattle as our beautiful plain for grazing can support—say from 500 to 1000 head, of which a certain number should be used for breeding and milk, and the rest for beef cattle. In regard to salmon, as a substitute for meat, I simply will state that it may do once in a while, but the less the better.

THE WATER SUPPLY OF THE SETTLEMENT.

From the landing-place of Kalaupapa up to Kalawao we have no regular water stream. Fortunately, at the upper part of the Kalawao valley there is one, but the water is not very abundant, though sufficient, if properly managed, to supply this one village. When I first arrived here the lepers were obliged to carry their water in oil cans from that gulch on their shoulders, or on horses, under the greatest difficulty; there also they used to wash their clothes. The scarcity of water at that time accounted, to some extent, for their living very dirty.

In the summer of A. D. 1873, we received some water pipes, and all our able lepers were only too willing to help in laying them, and in building a small reservoir. Since then Kalawao has been well supplied with good water for drinking, bathing, and washing, and has been proved to be a better place for living than Kalaupapa, where the people continue to resort to rain or brackish water, and in dry seasons they are obliged to come to Kalawao for it.

On studying this question of water supply, I was informed that at the terminus of the valley called Waihanau (water arise), which valley is located a little more than one mile south-east of Kalaupapa, and is a natural reservoir. At one time in company with two of our intelligent white men and some of my boys, I went to investigate the truth of it, and, after a two thousand feet of travelling in the gulch, we arrived at this truly beautiful reservoir, built by Nature's hand in the form of a circular basin:

its diameter in one direction is 72 feet, and 55 in the other. On sounding its depth we found 12 feet of water at a short distance from the bank, and 18 feet towards the centre. The water being ice-cold, none of my boys dared to swim across to ascertain its true depth close to the high cliff, where probably it is deeper. The water looks very clear, and has an excellent taste. I should remark here the statement which a native who, during the period of ten years, has made it his business to deliver water to any part of Kalaupapa for a certain fee, made to me, viz.: "That if no other source in the vicinity affords any water during very dry seasons, this basin has never failed to furnish any amount needed." The above statement was acknowledged to be true by a great many more of the old residents who had seen that reservoir, and confirmed it. This, and the large over-flow in connection with the drainage from above, leaves me to conclude that there must be a large feeding source below. This reservoir is perfect and permanent in itself, without incurring any expense or labor.

Now, instead of going to Waikolu to obtain a water supply for Kalaupapa, as was intended, which would be, besides the difficulty of labor of building a reservoir, and for laying from such a distance, say over five miles, the amount of pipes required for that purpose, a very large expense to the Government, therefore I simply recommend the laying of good pipes from this Waianau reservoir. The question of supplying water for Kalaupapa has been for a long time under discussion, and never thoroughly investigated, under the impression that it would cost too much, and there the matter rests at present.

My desire being to see the work carried on without any further delay, once I was sure of getting this supply of beautiful water at a comparatively short distance; and, wishing to give all the information necessary, I have taken the pains to measure the exact distance, which I found to be from the reservoir to the Kalaupapa store-house thirteen thousand six hundred and eighty (13,680) feet. All this distance is on an uninterrupted, gradual decline; and having on hand a better reservoir, and a surer supply of water than we have at Kalawao with a 2-inch pipe for half the distance, and 1½-inch for the remaining part, without a doubt the Kalaupapa village can be abundantly supplied with good, pure water. And having here a man capable of executing such a work, with many hands to assist him, I think that the expense above the cost of the pipes would be but a trifle.

THE DWELLINGS OF THE LEPERS.

Good ventilation being in general one of the first conditions of hygiene, it is much more necessary for our lepers on account of the fetid exhalations from them being much greater than from any other disease.

In previous years, having nothing but small, damp huts, nearly the whole of the lepers were prostrated on their beds, covered with scabs and ugly sores, and had the appearance of very weak broken down constitutions. In the year 1874 the great question was—how to improve the habitations of the unfortunate people, the Government appropriation being at that time barely enough to provide them with food?

During that winter a heavy south wind blew down the majority of their half-rotten abodes, and many a weak leper laid there in the wind and rain, with his blanket and clothes damp and wet. In a few days the old grass beneath their sleeping mats began to emit a very unpleasant vapor. I at once called the attention of our sympathizing Agent to the fact, and very soon there arrived several schooner loads of scantling to build solid frames with. All lepers who were in distress received, on application, the necessary material for the erection of the frames, with one inch square laths to thatch the grass or sugar-cane leaves to. Afterwards rough N.W. boards arrived, and also the old material of the former Kalihi hospital. From private and charitable sources we received shingles and flooring. Those who had a little money hired their own carpenters; for those without means the priest, with his leper boys, did the work of erecting a good many small houses. Besides, some new comers who had means built their dwellings at their own expense.

In 1878, after the inspection of the Settlement by a special committee, of which Your Excellency, then a member of the Assembly, was chairman, sent by the Legislature to Kalawao, the Board of Health having obtained a larger appropriation by a special recommendation of that committee, at once erected a good many comfortable houses, and also provided several other comforts for the lepers, of which they were greatly in need of.

Lime has always been supplied by the Board of Health gratuitously for whitewashing the cottages, and thus, little by little, at comparative small expense to the Government, combined with private or charitable resources, were inaugurated the comfortable houses which constitute to-day the two decent-looking villages of Kalawao and Kalaupapa. I estimate the number of houses, at present, both large and small, somewhat over three hundred, nearly all whitewashed, and, so far, clean and neat, although a number of them are not yet provided with good windows. These houses, of course, cannot have the proper ventilation they need, and naturally create an unpleasant and unhealthy smell, I therefore humbly pray that the Board be kind enough to take steps and see that this still-existing evil be soon remedied. In conclusion, I am happy to remark that, if I compare the present with the past, the unfortunate people of to-day are not only more comfortable and better off in every respect, but their disease in general is a great deal milder and less progressive, and,

in consequence, the death-rate is not so high. This is greatly due to the improvement in the houses.

THE CLOTHING OF THE LEPERS.

The Settlement being situated at the northern side of the island, and backed at the south by very high and steep mountains, the climate is naturally cool. The winter season brings forth generally a long spell of cold weather. The disease, too, at a certain stage, interferes much with the free circulation of the blood, and therefore our lepers often complain of cold. Those who have suitable and warm clothes to protect themselves from the inclemency of the weather resist it generally very well; but for those who, through neglect or destitution, have barely enough to cover their nakedness, the cold and damp weather has a bad effect. They then begin to feel feverish, and cough badly; swelling in the face and limbs sets in, and if not speedily attended to the disease generally settles on the lungs, and thus hastens them on the road to an early grave. On my arrival I found the lepers in general very destitute of warm clothing. So far they had received from the Administration a suit of clothes and a blanket; but some of them being very neglectful and filthy, in a few months nothing remained but rags. Those who had friends in the outer world were fortunate in receiving from time to time a few articles of clothing, but the friendless and the poor suffered greatly. There was no store at the time within the limits of the Settlement where they could buy a new garment or other necessities, and those who received or could earn some money had to entrust it to the captain of the schooner to buy for them what they were in want of.

We all greatly felt the necessity of a suitable market store, and, on a very sound principle, the Molokai store was inaugurated by the Board of Health in the summer of 1873. To start with, a thousand dollars out of the appropriation was invested to lay in the first stock, and with a certain percentage above the cost price to cover current expenses, the store has, since then, been running on its own account, supplying our people with any article they may wish to buy. Every year the Board issues an order for six dollars to each leper to enable them to buy at the said store what they are in want of, especially in the line of clothing. So far, this store has proved to be a success, and a great convenience to the people here, and we could not do very well without it.

Besides the allowance by the Board of Health, Christian charity has given us a helping hand in the matter of clothing, and assisted us to our great satisfaction. In previous years it was nothing unusual to receive from time to time a cart-load of clothing for distribution to the needy; for instance, such as was received a year and a half ago from the hands of Her Majesty

Queen Kapiolani, and those who assisted her in filling the leper subscription. Thanks for aid in the past. May the future prove that untiring perseverance of charity continues to assist the Board of Health in supplying the unfortunates of Molokai with all their necessities—especially with warm clothing, because, may I here remark, that the yearly allowance of six dollars to provide clothes and other indispensable articles is quite insufficient for those who have no private means, and no friends or relatives to give them a helping hand. I beg to lay this statement, based on a long experience, before the Honorable Board of Health for future consideration.

The allowance granted by the Board, combined with Christian charity and some private industry, of which I intend to speak of hereafter, has greatly ameliorated the condition of our lepers, and provided them with comparatively good clothes.

EXERCISE FOR THE LEPERS.

Leprosy is a constitutional disease by which, generally, the circulation of the blood is partially obstructed, the nerves and muscles more or less paralyzed, and the limbs are often disabled in one place or the other, which varies in almost every case.

A person afflicted with leprosy, who quietly gives himself up to the ravages of the disease, and does not take exercise of any kind, presents a downcast and sloughy appearance, and threatens soon to become a total wreck. Therefore exercise, as a daily occupation, is highly commendable to invigorate the system, giving a fresh impetus to the general movement of the muscles and to the free circulation of the blood, thus averting many pains, sores, and other consequences of a prostrated constitution.

In former days (from 1866 to 1873) all the lepers being collected at the rather small village of Kalawao, the majority of them passed their time in sleeping, drinking, and playing cards, while only a few others cultivated the fields; and horses being limited at that time, a minimum number only of the inmates could enjoy the exercise of a horse ride.

Later on, all that tract of land at Kalaupapa having been annexed to the Leper Settlement, travelling was at once increased to a great extent; going from one village to the other became not only a healthful exercise and pleasure, but of a frequent necessity; horses too have increased, and are easily procured. This tract includes a very fertile piece of cultivable land; over two hundred acres are fenced in along the foot of the mountains. Every leper is privileged to occupy any vacant portion of it he may choose to cultivate, as some were already accustomed to do in the Kalawao fields.

Travelling on foot, riding on horseback, and cultivating the soil are the most healthy occupations of our lepers. Let me, therefore, bring to notice that, up to the present date, about nine-

tenths of the entire population are enjoying these invigorating occupations and exercises, while previously only about one-tenth could do so. Such daily exercises as can be obtained here does not only strongly aid in checking the disease in its rapid progress, but also averts many ailments which otherwise might befall the victim. Inducements of this kind, in regard to daily exercise for the welfare of all afflicted which this Settlement affords, cannot likely be got up in any other asylum in the world.

In regard to the wholesome exercise obtained by cultivating the soil, a few facts showing how it has been, and should continue to be encouraged, may here be brought under observation. Soon after that piece of land mentioned above had been put at the disposal of the lepers many, whose hands were not too much mutilated, began at once to plant a patch of sweet potatoes, and **very soon had an abundant crop.**

During winter when the boats, which had to supply the Settlement with taro, were prevented from arriving on account of the bad weather, the local administration was fortunate enough to get a weekly supply of sweet potatoes from those who had a quantity at their disposal, and thus not only prevented a temporary famine, but the money usually paid to the outsiders for paiai was paid into the hands of our lepers, and, little by little, money came into circulation among the poor people. This being a great encouragement, very soon the majority had some potatoes of their own planted, and shortly afterwards they petitioned the local administration to obtain instead of their weekly rations its equivalent in money. This having been granted, numbers of lepers availed themselves of this opportunity to obtain some cash to buy their little necessities with.

This system of paying money, instead of giving the weekly supply, continued for about eight years, varying in amount according to the harvest of sweet potatoes, and sometimes through the deficiency of taro. Besides the great benefit of a healthy exercise for the sick, their monthly ration-money not only alleviated the condition of those who availed themselves of it, but brought some money into circulation, and created between the two villages many other kinds of small industries.

The Leper Settlement store, too, at that time had a larger business, because there was money in the hands of the people who, in general, called there to provide for all their different needs.

Up to within recently the people were in comparative ease at the Settlement, but at present the system of paying the equivalent of rations, on account of abuses, having been taken away, though they have enough to eat, they are, nevertheless, getting in very poor circumstances. This system was very beneficial for the health and comfort of the lepers, as I have shown, and not

any more expensive to the Board of Health, therefore, in the interest of the great majority, I humbly suggest that the Administration will have the kindness to resume the old practical system.

THE KOKUAS, OR ASSISTANTS, WHO ACCOMPANY THE LEPEES TO THE SETTLEMENT.

On this important subject, distinction has to be made between married and unmarried kokuas. I think it is but justice, and in accordance with Divine and humane law, that faithful husbands and wives of lepers should be allowed to accompany their partners to their exile at Kalawao.

In the fulfillment of my duties as priest, being in daily contact with the distressed people, I have seen and closely observed the bad effect of forcible separation of the married companions. It gives them an oppression of mind which, in many instances, is more unbearable than the pains and agonies of the disease itself. This uneasiness of the mind is, in course of time, partly forgotten by those unfortunates only who throw themselves into a reckless and immoral habit of living. Whereas, if married men or women arrive here in company with their lawful mates they accept at once their fate with resignation, and very soon make themselves at home in their exile. Not only is the contented mind of the leper secured by the company of his wife, but the enjoyment of good nursing and assistance, much needed in this protracted and loathsome disease, and which no other person could be expected to impart.

I am happy to be able to state that the marriage ties of lepers have been more respected by His Majesty's Government during the past few years than they used to be; the physical and moral life at the Settlement has greatly improved, and the lepers are much better taken care of. Besides this, our good kokuas are not only of great help and assistance to individual lepers, but they are also of great value to the local administration for carrying on all work needed for the welfare of the place. May I bring to the notice of the honorable members of the Board of Health that not only is our Settlement benefited by such kokuas, but the public at large are rid of a dangerous element; and I must assert that it is my solid opinion that all persons, with a very few exceptions, who have cohabited in the matrimonial state a certain length of time with a leper are a standing menace to society at large, of which only too many proofs have unhappily come under my personal observation. I here leave the medical profession to settle to what extent the danger of contagion or non-contagion through cohabitation may extend.

I am happy to give the present Board of Health credit for their lenient action in this important matter, at the same time I am obliged to mention that I disapprove the coming of all others

but married kokuas to the Settlement with the intention of making it their place of abode. My disapproval of seeing unmarried kokuas settle here is based on the following reasons :

1. Because, with the exception of a few old people, unmarried kokuas are not generally faithful and persevering in assisting those patients in whose favor they were permitted to come here.

2. They are, in general, a source of immorality, and a temptation to lead the lepers into bad habits, and, through their bad example, sometimes create trouble in the place.

3. Because, having no natural tie here they, after a long intimacy with the lepers, may leave the place whenever they choose; and, although the disease may not yet be visible, it is highly probable that they carry the germs of it to their homes, and thus become a well-fitted medium to spread the disease amongst their numerous friends.

4. They are of very little use here, if of any use at all. They will not do anything for the poor sufferers except for payment, with the proceeds of which they go gambling, and generally go round from house to house and help to consume the poor lepers' scanty rations; they have no fixed abode, and are too lazy to work for their own support—in some instances, they even try to obtain the lepers' clothing by some means or other.

For these serious reasons, I venture to recommend to the authorities that they be more strict in the future than they have been in the past years; and, to prevent imposition, let proof be shown of legal marriage before a permit is granted. Moreover, temporary visits which may be allowed to elderly people should be always of the shortest possible period, and the strictest severity should be resorted to in order to prevent any healthy child or young person from entering the Settlement.

THE MORALITY OF THE LEPER SETTLEMENT.

I feel myself obliged to beg leave of Your Excellency to be allowed to speak of a very serious matter, in which I officially appear as one of the principal agents. To avoid criticism I will, with a liberal mind, lay aside as much as possible all difference of creed and opinion, and show how needful a step has been taken for the temporal and eternal welfare of our lepers by drawing a parallel between the past and the present, and between those who yield and do not yield to moral training.

Previous to my arrival here it was acknowledged, and spoken of in the public papers as well as in private letters, that the greatest want of the lepers at Kalawao then was not having a spiritual leader or priest, the consequence of which was that vice, as a general rule, existed instead of virtue, and degradation of the lowest type went ahead as a leader of the community. On the arrival of a new number of lepers, the old ones were soon at work to impress them with the erroneous axiom: "Aole kanawai

ma keia wahi"—in this place there is no law. Not only in private conversation, but in public meetings, I myself heard this doctrine proclaimed; and for a long time, indeed, I was obliged to fight against its application being made to the Divine law as well as to human law. In consequence of this impious theory, the people, mostly all unmarried, or separated on account of the disease, were living promiscuously without distinction of sex, and many an unfortunate woman had to become a prostitute to obtain friends who would take care of her, and the children, when well and strong, were used as servants. When once the disease prostrated them, such women and children were cast out, and had to find some other shelter; sometimes they were laid behind a stone wall and left there to die, and at other times a hired hand would carry them to the hospital. The so-much-praised "aloha" of the natives was entirely lacking here, at least in this respect.

As already mentioned in other pages, the Hawaiian "hula" was organized after the pagan fashion, under the protection of the old deity Laka, who had his numerous altars and sacrifices, and I candidly confess that I had hard work to annihilate Laka's religion and worship, and thereby put a stop to the hula and its bad consequences. Though the people had reached the climax of despair both of soul and body, may it be said to their honor that I found them less addicted to sorcery and the doings of the "kahuna lapaau," or native doctors, than I had found the old natives in Hawaii—circumstances which encouraged me much to stay permanently amongst them, with the quasi certain hope of my ultimate success as a Catholic priest.

By a short digression, I will here speak of another source of immorality, viz., the evil effects of intoxication. I first have to explain how they obtained the material. There grows very abundantly along the foot of the mountains a plant which the natives call "Ki" (*Dracæna terminalis*), the root of which, when cooked, fermented and distilled, gives a highly intoxicating liquid. The process of distilling being very crude and imperfect, produces, naturally enough, a liquor which is totally unfit for drinking. A short time after my arrival the distilling of this horrible liquid was carried on to a great extent. Those natives who fell under the influence of it would forget all decency, and run about in a nude condition, acting as if they were totally mad. The consequences can be easier imagined than written on paper. The local authorities have endeavored to stop all those horrible proceedings, but for a long time they were unsuccessful. It being discovered that certain members of our police were in league with the evil-doers, the "luna nui" and myself went round, and both by threats and persuasion, they finally delivered up their implements which were used for distilling; some of the most guilty perpetrators were convicted, but were pardoned under the condition never to do it again.

For a long time, as above stated, under the influence of this pernicious liquor, they would neglect everything else except the hula, prostitution and drinking. As they had no spiritual advisor, they would hasten along the road of complete ruin. A good many of the sick and prostrated were left lying there to take care of themselves, and several of them died for want of assistance, whilst those who should have given a helping hand were going around seeking enjoyment of the most pernicious and immoral kind.

As there were so many dying people, my priestly duty towards them often gave me the opportunity to visit them at their domiciles, and although my exhortations were especially addressed to the prostrated, often they would fall upon the ears of public sinners, who, little by little, became conscious of the consequences of their wicked lives, and began to reform, and thus with the hope in a merciful Saviour, gave up their bad habits.

Kindness to all, charity to the needy, a sympathizing hand to the sufferers and the dying, in conjunction with a solid religious instruction to my listeners, have been my constant means to introduce moral habits among the lepers. One of the great moral improvements which helped to do away with licentiousness was the granting of inter-marriage licenses between lepers who were not prevented from marriage by a previous marriage tie, and many a couple are to-day living at the Settlement in a decent manner.

I am happy to say that, assisted by the local administration, my labors here, which seemed to be almost in vain at the beginning, have, thanks to a kind Providence, been greatly crowned with success, as, at present, there are very little, if any at all, of the above-mentioned evils committed.

MEDICAL TREATMENT.

Leprosy, from time immemorial up to the present, has always been recognized as an incurable disease. In laying my views before your Excellency, with regard to medicine, I must draw distinction between a developed and an incipient case. In regard to the first, a judicious medical treatment may be followed up, with advantage, to ameliorate the condition of a leper, to alleviate his pains, and to stay somewhat the progress of the disease; but not with the view of obtaining a perfect cure, for such a blessed effect we must look for, and only can hope, in a supernatural gift.

Perchance, in the near future, through the increasing interest and untiring perseverance in the study of the disease, by the most intelligent physicians and scientists, a proper specific for the cure of leprosy may be discovered, which to my knowledge has not yet been found.

In regard to an incipient case, where the disease is not yet developed, there, in my opinion, with proper medicine, good diet,

cleanliness, complete separation from all leprous persons, and other necessary means, taken with perseverance, there only the hope to eradicate the disease from the system, or at least its progress entirely checked, may be entertained. It is now about twenty years since this settlement was established, and this term may be divided in three separate periods.

As I arrived here at the end of the first period, 1866 to 1873, I can only state how I found things at that time. I remember well that the poor people were without any medicines, with the exception of a few physics, and their own native remedies, from which, I judge, it had been the same from the inauguration of the settlement. It was a common sight to see people going around with fearful ulcers, which, for the want of a few rags, or a piece of lint, and a little salve, were left exposed to dirt, flies and vermin. Not only their sores were neglected, but any one getting a fever, diarrhœa or any other of the numerous ailments that lepers are so often heir to, was carried off for want of some simple medicine.

In the same year of my arrival at the settlement, 1873, there arrived a white man, a leper himself, who had been an assistant to the doctors at the Kalihi hospital. He had quite a practical knowledge of simple medicine, and having been put in charge of our hospital, he especially attended to the patients there, while I, for my part, attended largely to those living outside. Our stock of medicine, the greatest part of which was always supplied by the Board, consisted of the most common necessities. Very soon, the people perceiving that by the use of such simple medicines as we had to dispose of, their troubles were generally greatly ameliorated, and therefore they begun to call more and more for the simple remedies, and thus gradually a perceptible improvement took place. As we had no doctor during this second period, we tried to do the best we could.

During the period of now about eight years, from 1878, we have been under the treatment of four different physicians, to whom the Government has furnished, at great expense, all the different medicines they may have applied for. May I be permitted to direct your Excellency to the annual reports of those intelligent gentlemen, and be excused for not expressing any judgment about their different treatments.

APPENDIX N.

REPORT OF R. W. MEYER,

*Agent of the Board of Health at the Leper Settlement, Molokai.
April, 1886.*

The accompanying report of Mr. Meyer, Agent of the Board of Health at the Leper Settlement, in reference to the Settlement, is very interesting, in so far as it gives a somewhat connected view of the condition of things at the Settlement since its establishment, by one who was connected with it from its inception: but as Mr. Meyer has not been an actual resident, but has lived some ten miles distant, and only paid occasional visits to it, say once a month, he has not had the fullest opportunity to observe the condition of affairs, or to aid in carrying out every reformation that has or might have been carried out, or of accurately noting the various changes that have been made. Therefore Mr. Meyer has not dealt minutely with some of the most interesting events in the history of the Settlement as regards the phases of leper life, such as the Lepart, Walsh or Ragsdale management, when the last named was practically a king among his fellow sufferers, and holding in his will the power of life and death, nor to the labors of the Resident Physicians from the days of Drs. Emerson, Neilson and Fitch, to those of the present active incumbent. Information on these several points will, however, be found more fully set forth in other portions of this general report, and in some instances referred to by the appended foot notes.

REPORT.

To His Excellency WALTER. M. GIBSON,
President of the Board of Health.

DEAR SIR :—In presenting my report of the Leper Settlement for the past two years, I am led to reflect upon the great differ-

ence existing in the comforts and ease enjoyed by the lepers at the Settlement of to-day, when compared with the first few years of its establishment, now just twenty years ago. It may, therefore, not be amiss to recite briefly the history of that time, as it shows a constant endeavor on the part of the Government to improve the condition of these unfortunate people, and as I have been connected with the affairs of the Settlement ever since the very commencement (1865-66), I am in a position to speak from personal knowledge. [See Supplement, page 37, and Appendix, page lxxii].

Leprosy had already existed on the Islands for about 20 years before it seriously attracted the attention of the Government, and even then the nature of this disease was poorly understood, and the great magnitude of the calamity was not realized, excepting by a few men of the medical profession, who urged the necessity of segregation, as being the only means known through which this terrible disease had been stamped out in other countries, and it was justly hoped that segregation here would lead to a similar favorable result; and it probably would have done so, had it been possible to rigidly enforce the segregation of lepers, even as late as the time when the law of segregation was enacted (1865) for the known cases of Leprosy on the islands at that time were comparatively few.

The present site of the Settlement, which was established in 1865, was deemed to be the most suitable spot for the isolation of the lepers on the islands, one half of it being bounded by an almost vertical mountain wall, from 1800 to 2000 feet high, and the other by a deep sea, with a precipitous shore, excepting only in two places, one at Kalaupapa, and the other near Kalawao, where in good weather boats can make a landing safely.

The tract of land constituting the Leper Settlement projects from the main body of the island, and forms a kind of shelf, including probably an area of about 5,000 acres, abounding with every variety of soil, and everything necessary to supply the wants of natives (fruits, taro, potatoes and many other vegetables can be grown there to perfection), and leaving a large area of land to be utilised for the raising of stocks; the sea abounds with fish, and before this place was occupied by the lepers, it sustained a very large and thriving population.

Unfortunately the place is not well watered. There is, however, on the eastern boundary of the Settlement a considerable and never failing mountain stream in the valley Waikolu, which is about a mile, or a trifle more, distant from Kalawao, There are other springs in the valley of Kalawao, and one or two in the valley of Waihanau, but all at considerable distances from the habitations. These springs, however, during very dry times are subject to suffer a great diminution of water, and the one at Kalawao, at such times, is liable to dry up. [See Rev. J. Damien's Report, page cxiv.]

It was thought at that time if such a place, as above described, was given to the lepers, where they could live unmolested, they might, with the assistance of some of their families, make comfortable homes for themselves, without incurring much greater expense to the Government than the cost of collecting them together, giving them an outfit of clothing, a few other necessaries, and the transport to the Settlement. And such of these unfortunates who were known to be possessed of means, and who had not managed to place them in the hands of friends, in such a way that they could not be got at, had to pay them over to the Government as a reimbursement for expenses incurred in their behalf.

The original inhabitants of the place, owned a great many pieces of land and houses, the houses being mostly thatched ones, and only three or four were wooden structures, the lands were mostly planted with taro, potatoes, and other vegetables. Most of these houses and lands were purchased by the Government for the accomodation of the lepers, and the planted lands for their support.

All the first shipments of lepers were allowed to take their wives and husbands with them, or a son, and in some instances a daughter, but children were not permitted to accompany them.

The Board of Health bought for future use for the Settlement some young heifers, a few horses, one or two pairs of oxen, and a cart for the use of lepers, and they were expected to obtain their living from the growing crops, to take care and re-plant it and live there precisely in the same way as natives do in any settlement on the islands. [See page 42, Supplement.]

Unfortunately, segregations proceeded slowly, and six months or more had elapsed from the time of the vacation of the place to the time of the arrival of the first shipment of lepers, and when they arrived they found the cultivation fields overgrown with weeds, and they had very hard work to save enough to eat for themselves; however, they managed it, commenced to like the place, and got along very well until after considerable intervals one or two more shipments of lepers arrived.

No food was given these people, excepting what the first comers were willing to give them, which was not much; they were willing to work for themselves, but not for others, and the first trouble arose through it. Fortunately, the place was over-run with a native pear, and natives had lived on this fruit previously, and these beans supported them till the Board concluded to furnish these people with food for a sufficient length of time to enable them to raise their own. But their time, with many, never arrived; finding that they got food any way, they made no efforts to work for themselves, and supplies had to be bought. [See page 44, Supplement.] And many really could not work, their hands and feet being too sore. It was also found

that they could not obtain sufficient fish or meat for their support, and they received from the Board small allowances of salt beef or salmon. They were allowed three pounds of meat and one bundle of *paiai* per week, and nothing else. Some became destitute of clothing, and this was supplied them annually, and only to such as had no means or friends. The men received each a pair of blankets, a denim frock, a pair of pants, a hat, and some of them shoes. The women also a blanket, a shirt of blue or brown cotton, and a calico dress; with this they were expected to get along for a whole year.

For a considerable time there was nobody to look out for these people, a man was sent there just to receive them, show them the houses, and give them their weekly allowances of meat and *paiai*.

As already stated, water was scarce, and had to be carried considerable distances, and it may be imagined great inconvenience and considerable suffering arose from it.

It was but natural that troubles also arose between them which led to quarrels, and as there was nobody to settle these matters they had to do it themselves the best way they could. Many of them were approaching the latter stages of the disease, and those who had no friends or relatives with them suffered more or less; but I must say, to the credit of these people, that, as a rule, they almost always found a friend in their extremities. There was no hospital or building in those days where they could be taken care of.

It became necessary to appoint a Superintendent, and an elderly gentleman (Mr. Walsh), with his wife, were sent to the Settlement to fill this position. [See page 47, Supplement, 1868.] This gentleman having been an officer in the British army was accustomed to discipline, and he tried his best, and succeeded to a certain extent, to bring some system and order in the affairs of the Settlement. A hospital was erected, the building still standing, and the worst cases were taken there under the immediate care of the Superintendent and his wife. Food was prepared for them, and they got other things, such as a little bread, rice, some tea with sugar, and as by this time the heifers had become cows, there was some milk for them also; thus really for a time considerable suffering from want of attention was relieved. Unfortunately the Superintendent and his wife did not understand the Hawaiian language, and many of his endeavors to establish rule and order were not understood by the people, and constantly little troubles arose between him and the people, and they became as discontented as ever. The poor man fell sick and died, and his widow became Superintendent; as assistant, an old sea captain was sent up, but these two could not agree—neither of them could speak with the people, and matters did not improve; and, in addition to these troubles the

lepers did not receive their full allowance of meat, which was only three pounds per week. It culminated in the discontinuance of the foreign Superintendents, and natives or half-castes were tried, and as experience has proven, with the best results. Natives are perfectly willing to submit to considerable pressure, even oppression, if it comes from one of their own people, but not from a foreigner. [See Supplement, page 58].

It was often difficult to supply the Settlement with food, especially during the winter season, when the landings are bad: an attempt was therefore made to cultivate the valley of Wai-kolu with taro, and manufacture the paiai on the spot. This business was undertaken by agents of King Kamehameha V. in 1870; the valley was leased to them at a yearly rental of \$250, and they agreed to furnish the Settlement at the regular market price. Agents were appointed to prosecute this work, and, I am sorry to relate, that some of these agents, in their anxiety to please the King, took away from the poor lepers all the taro-patches they had cultivated for their own use without the least remuneration. One poor leper alone lost twenty patches: of course this proceeding put a stop to any future cultivation of lands by the lepers and their families. Thus matters continued at the Leper Settlement without material changes till the death of Kamehameha V. (in December, 1872), when, with the ascension to the Throne by Lunalilo, a new Board was appointed.

Segregation was held, by the new Board, to be the only means of arresting the progress of the disease, and the most energetic efforts were made to effect the isolation of lepers, and without regard to person. Lepers were no longer allowed to take their wives or husbands with them, and visits to the Settlement ceased to be permitted, excepting only under the most strenuous circumstances, and only for a brief interview.

The injustice of claiming the means possessed by lepers was at once discontinued; and in the instances where it had been collected, mostly from poor widows, it was refunded to them. The wants of the lepers were considered, and their weekly rations of meat increased, and they were also allowed a greater variety of food, and henceforth received five pounds of meat, or, if they wished, three pounds of salmon per week; also one bundle of paiai containing 21 pounds, or, if they wished, either 10 pounds of rice or 7 pounds of bread or flour, and 5 pounds of salt per month.

A little labor was considered to be beneficial, and even necessary, for the lepers; and, to encourage them to cultivate the lands again, they were allowed the choice to receive the cash value of their weekly supplies of food in lieu of the food itself. This arrangement, subsequent experience has proved to be of great benefit to the lepers as well as to the Board. The lepers managed to cultivate more food than was necessary for their

own use, and, during the winter months, when it was difficult to bring food from the adjacent valleys, there was a supply at hand which was bought from the people at the regular market price; thus many of them obtained means to supply wants which were not filled by the Board. Some accumulated money enough to build houses, and surrounded themselves with other comforts, and all without costing the Board one cent more than it would have done otherwise, and it was really rather a saving.

The difficulty of giving the lepers an annual supply of clothing caused it to be discontinued, and, instead of it, a store was established containing every variety of staple goods, to be sold at less prices, only with sufficient advance to cover the expenses of its management and attendance; and such lepers, instead of receiving clothing, was given a bill to the amount of six dollars, for which he could draw at the store what he wished, and these bills were given out just before the commencement of winter on the 1st of October. This arrangement has not been unprofitable to the Board, and it has been of the greatest comfort to the lepers up to this day, and, in fact, it would be impossible to do without it.

The great bulk of food consumed at the Settlement has chiefly been purchased from the people living in the adjacent valleys of Pelekunu, Wailau, and Halawa, and from there it was mostly brought by the planters to the Settlement in their own boats, subsequently in boats belonging to the Board, and by men hired for that purpose. As already has been said, during the winter season it is at times impossible for boats to land, and food cannot be landed. To meet this difficulty, a stock of provisions—bread, flour, and chiefly rice—has to be kept on hand to be used in such emergencies.

The valley of Waikolu, which forms a part of the Board of Health lands, seemed to offer the means to obviate all the difficulty, and another attempt was made to cultivate the same. A contract was made with the male friends or relatives of the lepers living at the Settlement to cultivate this valley for three years. They were to plant, take care, and prepare the taro, and deliver it to the officers of the Board, and they were to receive as remuneration one half of its market value. (See page 73, Supplement, 1874.) This plan promised to work well in the first and part of the second year; but the people got tired, and when the three years were up they were unwilling to continue the work, and it was given up again.

Besides lepers there existed, and still exists, a large number of people, males and females, who had been allowed to accompany the lepers during former years. Most of these, having no other homes, found the place a very likely one, where they could make an easy living, chiefly obtained from the lepers. To prevent the too great increase of these people, as well as to discourage idle-

ness, the old time-honored Hawaiian rule of "poalima" (fifth day) was established, and which was then in force all over the islands. It simply consists in that every able-bodied male has to give one day's labor per week to the Board, and in turn they were allowed to enjoy the privileges the land affords—precisely the same as the lepers, with the exception, however, that they receive no rations for either food or clothing. To this rule, being accustomed to it, all cheerfully consented, and it has been kept up strictly until recently, but the rule has not been abolished.

A limited number of these people called *kokuas*, or assistants, are absolutely necessary to live at the Settlement for the performance of the work connected with the slaughtering of animals, receiving and distribution of food, preparing food and providing fuel, local police, messengers, etc.; but all those regularly employed are exempt from the *poalima* rule, and, in addition, they receive food rations from the Board.

Hospital accommodations were increased, and bedsteads furnished to the inmates instead of their being compelled to lie on the floor or mats, as heretofore.

Water-pipes were laid on from the spring in the Kalawao gulch to the Hospital, with intermediate taps for the use of the people living all along the road, which relieved them of the great burden of going for the water, and carrying it considerable distances; and they also had more water.

When His Majesty Kalakaua ascended the Throne (in 1873), most of the gentlemen composing the Board of Health under Lunalilo, with the exception of the President, remained in office for some time, and matters continued to go on very much the same way as under Lunalilo.

The number of lepers at the Settlement had increased by this time to about 800, and, in spite of all their efforts to effect their isolation, numbers always remained behind. Want of sufficient means was probable the cause that segregation was enforced only spasmodically.

By this time the biennial Legislatures evinced more interest in the condition of their unfortunate fellow-men at the Settlement than had been the case previously, and at nearly every session a committee was appointed to visit the Settlement and report on their modes of living, sufficiency of food, houses, etc., of the lepers; and, in consequence of one of these visits during the Legislature of 1878, of which committee Your Excellency was chairman, the Settlement received the special attention of the Legislature, which resulted in an increase of their weekly meat rations from five to seven pounds, a number of cottages were also erected, and the lepers received additional necessary articles, such as soap and kerosene oil, and their allowance of 10 lbs. of rice was changed to 9 lbs., with 1 lb. of sugar.

Previous to this, the Settlement had received very little

medical attention, a physician used to come from Maui, two or three times a year, visit the settlement for a few hours, and return. Subsequently, efforts were made to obtain the services of a resident physician, the Legislature having provided an appropriation of \$10,000 for a physician for the Leper Settlement, which has met with varying success.

Unfortunately, the Hawaiians, with few exceptions, prefer their own remedies, and their own doctors; they have little or no faith in a foreign physician; they seem to fear most of them and their medicines, and if left alone, very few avail themselves of their services, excepting in some cases of severe accidents, or when all their own efforts have been unsuccessful, and the case may be well nigh hopeless. [See the reports of Drs. Emerson, Mouritz, and others, on this point.]

By this time, 1886, all the grass-houses at the Settlement have disappeared, and given place to wooden cottages, which are white-washed, inside and outside, twice a year, for which purpose, lime is furnished the people, by the Board, free of expense to them.

There are now, at the present day, according to a recent counting, in all, 327 buildings at the Leper settlement, which include all the hospital buildings, dwelling houses, store, store-houses, and drug-shop, and five places of worship, of which two are Catholic, two Protestant, and one a Mormon church. Of these buildings, 109 belong to the Board, partly purchased, little by little, from the Lepers, but chiefly built on purpose for their accommodation. The rest of the houses are owned by Lepers, built by them at their own expense, and some of them quite handsome ones; they number in all, 213 houses.

Most of these houses are of various sizes, and accommodate various numbers, but they have small rooms, probably more than three or four times the space allowed under ordinary circumstances; all these houses have windows and doors, and thus, as they are but one-storey buildings, they have all the necessary ventilation. There are now many more houses, than existed 8 or 10 years ago, when the number of Lepers reached 800 and upwards, whereas, at the present day, there are but 652. From this alone, it follows, that they are more comfortable, with regard to lodgings, than they have been.

The Leper Settlement with all its houses, neatly white-washed, with its churches and other buildings, its surrounding, imposing scenery, certainly presents a very pleasing and cheerful appearance, especially on fine days, when the population turns out.

The Lepers are allowed to own houses, and they may frequently be seen in large numbers, all dressed up, and enjoying themselves at their heart's content, some few also have carriages, and they may be seen driving; they have, also, a music band, very creditably managed by one of the Lepers. Were it not that these

unfortunates carry the evidence of their misfortune in their faces, it would be impossible to distinguish this settlement from any other of the same size on these islands. It is probably superior to many.

For the lepers who reach the advanced stages of the disease, as well as for those who have no friends, there are now fine buildings, called hospitals; they are wooden structures 46 feet long, by 20 feet wide, and 9 feet high, and for the better ventilation these houses are unceiled and have short chimnies to promote a current of air. There are two rows of bedsteads in these houses at a distance of about 4 feet between each; they are white-washed at least twice a year, inside and outside, and are kept as clean as it can possibly be expected with the means at hand. There the lepers are cared for, their food is prepared for them, they receive tea or coffee with sugar or milk, and some extras when the case demands it. These hospitals are at Kalawao, about 2 miles distant from the landing at Kalaupapa, and surrounded with a picket fence enclosing an area of about $1\frac{1}{2}$ acres. The ground in front of the hospital buildings within this enclosure has latterly been converted into a garden, where the inmates, or those who take an interest in it, plant flowers and some vegetables making the place look cheerful. The hospitals are in charge of a native steward, who, I am happy to say, takes considerable pride in doing his duty well, and to have all the buildings clean, and the wants of the sick attended to. A new cook-house has been built, probably 18 months ago, and whenever I have seen it, it always was clean and tidy, very different from what it used to be. These hospitals are also regularly washed, and there is really now but very little bad odor compared with former years, when the means of obtaining a sufficiency of water were difficult. The clothing of the inmates are washed by people employed for that purpose. But in spite of the care taken to make these people comfortable, very few care to go into the hospitals, they do not seem to feel at home there, and the buildings are seldom more than very partially filled; at present there are only 43 inmates: 36 of them are males, and 7 females.

Besides these hospitals there are two other buildings, one for boys and another for girls, which are in charge of Father Damien, and on this account they are in the immediate proximity of his own dwelling-house. These houses are intended for the reception of orphans or children who have neither parents nor friends at the Settlement.

Other children at the Settlement live with their parents, or relatives, in the same manner as they do in other places. There are two schools for them, one at Kalaupapa, the other at Kalawao; the former has a kokua, not a leper, for a teacher, the latter, a leper. The leprous and non-leprous children go into the same school, but are kept in separate places in each of these schools.

The number of scholars in all are 50, of whom 36 are boys and 14 are girls.

Some important improvements have been made during the period now ending. In the center of the Kalaupapa boat harbor were rocks on which, in years past, many a boat was wrecked, and much valuable material lost in consequence. The President of the Board sent Mr. Van Giesen who removed these rocks, and the landing is now comparatively safe to what it used to be in former years. Quite an extensive wharf, or boat-landing, has also been built, facilitating the discharge of freight and landing of passengers to a considerable extent.

A large and spacious store-house has been placed right at Kalaupapa landing, which was very much needed there; one end of this house is set apart for a drug-store and doctor's office for the benefit of that part of the population living at and near Kalaupapa. For this purpose a house has been removed from Makanalua, about a mile or a little more from Kalaupapa. This house was originally intended to entertain the visitors to the leper Settlement, in order to prevent their mixing with the lepers, but experience has proved the inexpediency of this measure and the house has never been used for that purpose. At Iliopi near the Kalaupapa landing is a well, where most of the people living there obtain their water supply, and over this well a neat little structure has been erected and a pump put in the well. This little structure adds much to the pleasing looks of the place besides affording a resting place and shelter for those coming for water. At Kalawao a new and comfortable dwelling-house has been built designed for the occupancy of a resident physician. The drug-store at that place has been removed a little distance off nearer the hospitals, and is now in a better place than it was before. [See Dr. Mouritz's report, appendix "L."]

A new cook-house has been built within the hospital yard, in place of the old one, which was too small and could not be kept sufficiently clean.

A small reservoir has been built near the hospital, for the purpose of having on hand a supply of water in case of accident, or repairs of the pipes.

The Kalawao water supply has been much improved in taking up about a couple of thousand feet of the old small pipes at the spring and replacing them with much larger ones, thereby allowing the old pipes to be utilized for a further extension of the pipes, and to provide the new slaughter-house, when built, with the necessary water,

The food supply during the last two years, with the exception of the first few months, has been very regular, and since about 8 months, at a somewhat reduced rate in price. Partly owing to the greater abundance of taro, and partly to the better modes of transportation, instead of bringing the supplies in boats as in

former years, it has been brought per steamer; and there has also been less bad weather during the winter to prevent landing.

The meat supply, also, has been much better, and the lepers have received chiefly beef and mutton, and salmon, only as a change during a very few instances, when a supply of stock did not arrive in time.

Each leper has received the rations as already stated, but since April 1st, of last year, the allowance of cash, in lieu of food, has been discontinued, and all have since that time received their rations in food. On the occasion of a visit to the Settlement by Your Excellency, as President of the Board of Health, in response to a petition from the lepers, the bread and flour rations have been supplemented with one pound of sugar, so that each leper now receives 7 pounds of bread or flour with one pound of sugar, and this makes the bread or flour rations about equal in value with the price of a bundle of pai-ai. Each leper, therefore, receives now, per week, as follows:

Either 7 pounds of mutton or beef, or 3 pounds of salmon, or fresh fish when it is to be had; either one bundle of pai-ai—21 pounds—or 9 pounds of rice with 1 pound of sugar; or 7 pounds of bread with 1 pound of sugar; or 7 pounds of flour with 1 pound of sugar; and per month; half a bar of soap and 5 pounds of salt. And to each house, or each family, or company living by themselves, one quart of kerosene oil is given per month for illuminating purposes.

On the 1st April, 1884, there were living at the Settlement, as

per weekly reports 754 lepers

Arrived from Honolulu since that time to date 137 "

Kokuas, or friends living with the lepers, have contracted the disease as per declaration of the visiting physicians 52 "

Making the total number 943 "

Of these have died, or been discharged:

Deaths 259 "

Discharged 32 "

291 "

Leaving the total number now alive at the Settlement

April 1st, 1886 (or supposed to be lepers) 652 "

Of these—607 are native Hawaiians, 19 half-caste Hawaiians, 19 Chinamen, and 7 white foreigners.

Besides the lepers, there are a number of kokuas, employed by the Board, who also draw rations of food only; and all children born at the Settlement from leper parents, whether they are already lepers or not, and a few cases of very old people who likewise receive rations of food for charitable reasons.

The average number of kokuas, including Father Damien and Rev. J. Kahanaloa, are about 25, old people 3, and children about 4; very young children receive half rations, or their mothers for them.

The total amount of meat and food, and other articles of necessity consumed by the lepers during these two years past is as follows:

100,801	pounds of rice
9,036	" of flour
40,769	" of bread
42,272	bundles of pai-ai, of 21 pounds each
24,450	pounds of potatoes
16,351	" of sugar
1,048	head of cattle, or 380,723 pounds of beef
2,522	" of sheep, or 81,288 pounds of mutton
26,660	pounds of salmon
2,110	gallons of kerosene oil
9,052	bars of soap
112,920	pounds of salt
Cash in lieu of food to April 1st, 1885, 12,326 pounds	
weekly rations, \$6,033 60	
150	pounds of coffee
27	" of tea
13	dozen yeast-powders.

And I must mention that *bakers' bread, and tea and coffee, are only given to the inmates of the hospitals, and the greater portion of the milk obtained from the milch cows at the Settlement.

Segregation of sexes has only been attempted within the hospital yard, where the women occupy separate houses from the men, and with the children, living in the two houses in charge of Father Damien.

The condition and behavior of married people at the Settlement appear to me to compare very favorably with other places, and I do not believe that their standard of morality falls below, if any, that of people living in other settlements. Everything is done to provide for married people—either separate houses or rooms, as far as the means at hand allow this to be done.

The lepers do not directly receive clothing from the Board, but they receive an order to the value of six dollars annually, for which they receive at the store whatever articles they stand in need of; but I must say that, as they now have no means of earning any money, that those who have no friends to assist them cannot clothe themselves sufficiently for six dollars per annum, and there would be more or less suffering were it not that charitably-disposed people, especially from the people of Hono-

lulu have occasionally sent—such as the contributions of clothing, etc., collected by Her Majesty the Queen—these unfortunates presents of clothing, which supplied the wants of the needy ones.

Friends and relatives of lepers living on the other islands are permitted to visit the Settlement and live with the lepers for a shorter or longer time, from one week to a month or more, provided, however, that they produce a permit, as required by law.

For the preservation of law and order, a magistrate has been appointed, who, although vested with the authority of a district judge, uses his office chiefly as a judge of peace, or peace arbitrator. All difficulties and disputes arising between the lepers are settled in a friendly manner, without expense to either party, and apparently to the satisfaction of all.

With the exception of the one unfortunate case of manslaughter, committed at the Settlement in November last, crimes have been of rare occurrence. Since 1882 there has been but one case of burglary, and during the last two years only one case of attempted burglary. For such crimes, of course, the offenders are punished with imprisonment; but, being sick, the time of imprisonment is made very much shorter than the law really prescribes.

As laws and rules which cannot be enforced had better not be made, it has ever been the endeavor of those having had charge of the affairs of the Settlement to establish as few of them as possible, and only such which years of observation and public opinion at the Settlement made and approved. These rules, therefore, are few, but the following of them have been the means of preserving the peace.

Each leper has the right to select a building spot wherever he pleases, provided the place is not essential for purposes of the Board of Health, and he is therefore required to notify the superintendent. Each leper on arrival at the Settlement has also the right to select the family or company he desires to live with, provided, however, they do not object to it. If they object, he is given a place with others who are not adverse to it.

Lepers building houses at their own expense, have the right to sell those houses again to other lepers, for lepers to live in. All houses built by lepers at their own expense, therefore owned by them, are, nevertheless, considered to be under the control of the Board, if to assert such a control, for good reasons, should become necessary.

Lepers trusting one another with money or other things, must do so at their own risk, nothing is done for them, officially, by any officer of the Board.

Claims against deceased lepers for services rendered during

their last illness are respected, if testified to by the leper before death and in presence of the chief officer of the Settlement; and if his heirs do not pay the disputed amount, his property, if he leaves any, is sold and sufficient of the proceeds is paid for such services.

The property of a leper who dies without heirs at the Settlement or assigns, is sold by the sheriff of the Board and the proceeds are forwarded to the President of the Board of Health, and the death of the leper is advertised in the papers that his heirs may come forward and claim what he left. Wills left by lepers are also carried out by the Board, provided they are satisfactorily made out and properly witnessed.

Drinking intoxicating beverages is forbidden, and persons found drunk are punished with 24 hours imprisonment.

Making intoxicating drink from potatoes or ti root is likewise prohibited and punished, and all material used in making the same is confiscated and destroyed.

Liquor for the use of lepers and kokuas is not allowed to enter the Settlement, and suspicious looking packages when they come ashore are opened. If liquor is found, it is confiscated and destroyed, or sent to Honolulu to the Marshal, to whom opium, if found, is also sent.

Gambling is also forbidden at the Settlement, and guilty persons are punished.

For the kokuas, the same rules are applied with some additional ones.

Every able-bodied male kokua is to give one days' labor to the Board, per week, for which he enjoys all the privileges and benefits of the place.

Kokuas deserting their leprous wives, or husbands, on whose account they were permitted to live at the Settlement, are told to leave.

Kokuas repeatedly guilty of disorderly conduct, or gross immorality, are likewise ordered to go.

Every kokua can leave the Settlement when he pleases, but he cannot return without a special permit from the President of the Board of Health.

Kokuas, guilty of crimes or misdemeanors, are tried according to the laws of the Kingdom.

These are, substantially, all the rules, which have, thus far, been observed at the Settlement, and with the exception of the unfortunate occurrence last November, already mentioned, affairs have gone very smoothly during the past period.

During the past twelve or fifteen months, the lepers have had a much better opportunity to avail themselves of medical attendance, than they have ever had before, having had the ser-

VICES of a resident physician during the greater portion of this time.

The live stock now running on the pastures belonging to the leper Settlement, consists in 235 horses, 288 mares and 74 colts; in all, 597 horses; 40 cows, 18 steers, 25 heifers, 10 working-oxen, 1 bull and 25 calves; in all, 119 cattle; 20 jackasses and 3 mules; in all, 23; making a total of animals of 739 head; now running on the land.

Suggestions for further improvement, of the condition of the lepers and additional comforts, I have but few to make.

Since the discontinuance of allowing lepers the choice of receiving the cash value, in lieu of their weekly food rations, many of them have become rather poor; they do not plant as much as they used to, as they cannot sell their produce, it ceases, with them, to be an object to raise it.

I beg, therefore, to recommend the re-establishment of the system of giving them the choice to receive either the food itself or cash in lieu thereof, besides providing means as much as possible to enable them to earn a little money, such as by raising potatoes and purchasing them again, as used to be done for the supply of the hospital, and others who very often prefer them to *pai-ai*, rice or bread. They will then be able to supply themselves with some additional clothing and other necessities, for, as already said, "six dollars per annum is insufficient to clothe anybody for 12 months. It does not cost any more to give them cash in the line of food, rather the contrary, and were it only practicable to adopt the plan of giving them *all* cash in lieu of food and meat, it would very much simplify the management of the place, and be less expensive.

Whilst I do not wish to deny the desirability of laying a larger water-pipe, and extending the same to Kalaupapa, I must say that no absolute necessity for it exists, but should means be at hand and permit it to be done, I would recommend that it be done. And in that case, I would still advise obtaining the water from an abundant and unfailing source, by which Kalaupapa, Makanalua and Kalaupapa, and the entire Settlement, can be supplied at once, for almost any desired purpose, then to obtain the supply from springs which are too much dependent on our irregular and uncertain rainy season, even should it cost a little more.

I would also recommend the erection of a new slaughter-house, the present one is getting old and in a place where it is difficult to be kept clean, and put in a place where it can be supplied with water from the pipes, and save the expense of carting the same.

Furthermore, I consider it an advantage, when providing the

Settlement with beef-cattle, to obtain a larger number at once, sufficient, perhaps, to last three months, that they may derive some benefit from the extensive pastures.

As a rule, cattle lose in weight for the first two weeks after being landed, owing to change of place and pasture, but will soon regain what they have lost, and probably add considerably to their weight.

To the request, what my experience and observations during these years of my intercourse with lepers and others, have taught me, relating to the contagiousness or uncontagiousness, heredity and causation of leprosy, I will give the result which may be taken for what it is worth.

In the face of so much evidence of its spreading in so short a time as it has done on these islands, it is hard to conceive how anybody, professional or non-professional, can doubt the communicability of leprosy. It is simply the extreme slowness of its action and development, the apparent immunity from it, which so many seem to possess, and the imperceptible manner of its communication, which could have led to the conclusion that the disease is not contagious.

I arrived on these islands in 1850, and very little, if anything was then known of leprosy; about the year 1857, I first heard of its appearance amongst natives, under the name of Chinese disease, or in Hawaiian, "Mai Pake." It was recognized by the few Chinese, then on the islands, and this has given it the name of "Mai Pake" here, and not because it has been introduced here by the Chinese. It is much more likely that it came to these islands through the mixed crews of whale-ships, which had negroes, black and white Portuguese, and men of other races, coming from countries where leprosy was, and still is, prevalent.

In about 1859 or 1860, I saw on this island the first case of leprosy, it was a young man, he died with it in less than three years. The young man's mother took care of him, and, probably, in 1868, she showed signs of leprosy, and died a leper at the leper Settlement. I have known these people well, for they lived in my neighborhood. I only mention this one case, although I have account of others. And at the leper Settlement, whilst there are many cases where people have lived together for many years, without showing visible signs of leprosy at present, there are enough who do, and as I reported before, 52 kokuas alone, have become lepers during the past two years, or declared to be lepers, by the physicians attending. Again, a number of foreigners of various nations, American, English and German have become lepers.

Is it reasonable to suppose that all these men would have

become lepers, had they remained at home where they were born? They became lepers, because they came here, to a place where leprosy was prevalent, and exposed themselves to it.

Leprosy attacks the robust as well as the delicate, but it appears that people with syphilitic and broken-down constitutions are more apt to become its victims. That, no more foreigners have contracted the disease than they have, is simply owing to their better mode of living and care they take, to avoid coming in contact with leprosy, and it may be that they possess a greater degree of immunity.

The disease appears to me also to be hereditary, and I will give a short history of a couple, a man and his wife, living also in my vicinity. Both man and wife are strong and hearty looking people, they show no outward signs of the disease, yet their children at the age of 6 or 7 years became lepers one after the other, several of them were taken to the Settlement years ago, and there died lepers, and they have now with them another child, also a leper. How did these children become lepers? The husband's mother died a leper, the wife's father likewise. Is here not reasonable belief that these children were born with the germ of the disease in them, and that it was transmitted to them through their grand-parents? Similar cases exist or have existed at the leper Settlement. Another significant fact is the great number of cases of leprosy existing, where other and older members of the family of such cases are lepers or have died with it.

The cause of the disease appears to me to be more or less speculative, but taking a general view and comparing the same with other diseases, it is not improbable that leprosy is caused very much in the same manner as they are. If it be true that like causes, under like circumstances or conditions, always produce the same effect, or similar causes similar effect, it must be evident that all diseases, running a known course, from that visible beginning to the end, must have had always the same origin, each disease peculiar to its kind, very much like the sprouting and growing of seeds of different plants.

What this origin of leprosy or other disease consists in I do not pretend to know, it may be a parasite or organism of an inconceivably small size, which enters the body, and under unknown conditions develops and reproduces itself until it has taken possession of every part of the body including the organs of reproduction.

Until the true cause of the origin of leprosy has been discovered, there does not appear to me to be much hope of arresting the progress of the disease or effecting a cure, and no other means can be expected to stem the spread of this scourge, than

the most merciless and rigid enforcement of the law of segregation. It would prove to be the most merciful in the end. Twenty years of segregation have now been practised. What is the result? there are as many lepers as ever, more than in the commencement.

Halfway measures are here of no avail, they simply amount to a constant repetition of those heart-rending scenes, experienced by so many, of separating husbands from wives, parents from children, brothers from sisters, and without accomplishing the important purpose of saving the rest of their fellow-men, and for which they were required to suffer, and willingly gave up their liberty.

I am fully aware of the insuperable difficulties encountered in carrying out the law of segregation on these islands, and therefore doubt the possibility of having it carried out to the extent it ought to be.

There is, however, one hopeful sign, the disease appears to assume a milder form, and the number of the very bad cases, of which there were so many in former years, is very much smaller and the disease appears to progress slower.

I have the honor to be, sir,

• Your obedient servant,

R. W. MEYER,

Agent Board of Health.

APPENDIX P.

REPORT OF DR. E. COOK WEBB ON THE BRANCH HOSPITAL AT KAKAAKO.

HONOLULU, March 1, 1886.

His Excellency WALTER M. GIBSON,
President Board of Health.

DEAR SIR:—I have the honor to submit for your consideration my report for the portion of the biennial period that I have had charge of the Branch Hospital at Kakaako. As regards the treatment of leprosy I have but little to say. Notwithstanding any treatment which I have used, or seen used, I cannot see any change in any single case. I am fully convinced, after considerable study and experience, that personal cleanliness, good, nourishing food, and regular habits, have done more towards the relief of these unfortunates than all the medicine that has ever been prescribed for them in the past. Many patients, on coming into the hospital in a weak and exhausted condition, after a short time show manifest signs of improvement, and continue to improve for a considerable length of time without any treatment whatever. I do not wish to be understood as saying that they do not require treatment for other diseases than leprosy, for they are more subject to certain ailments than others that are perfectly amenable to treatment. In all the cases of leprosy I have seen, the disease has steadily progressed to a fatal termination, notwithstanding all treatment. I am aware that I am taking strong grounds against the many so-called "cures" that have been devised, but, in so doing, I am not basing my opinion on my own study and experience alone, but on the opinion of those who for years have been in daily contact with the disease, and have made it a special study, and they have come to the conclusion that it is a disease "sui generis" and "incurable." So much has been said and written on the subject of the contagiousness of leprosy that I cannot allow the opportunity to pass without putting myself on record.

I have not formed a hasty opinion, neither is it based on facts gleaned alone in these islands; but I shall deal alone

with these islands to produce what I believe to be strong points against the theory of contagion. Were it as contagious as many physicians have stated it to be, more than one-third of the foreign population of these islands would have become lepers long ere this. Before the medical profession, and many of the laity, became as familiar with the disease as they now are, there were numbers of foreigners who had lepers in their employ who were more or less affected. These servants performed all the domestic duties that are performed by domestic servants to-day—cooking, washing, etc. Notwithstanding this well-established fact, it is perfectly apparent to the ordinary observer that the percentage of leprosy among foreigners is, and always has been, remarkably small. I have had it from several of the older residents that in times past they have seen spots and eruptions on the bodies of some of their servants that they now know was leprosy—and they know that some of them have since died at Molokai.

There is a vast amount of unwritten history of leprosy in these islands that, were it placed before the people, with the names of those who are familiar with all the facts, would almost entirely do away with the bugbear of contagion. Family and social considerations prevent these people from giving their statements to the public as they would to a physician, whom they think is honestly seeking for facts for his own professional benefit. Within the past two or three years there has been a great amount of feeling among foreigners in regard to the rapid increase and spread of the disease, and this idea has been kept constantly before them either for reason of personal aggrandizement, or a desire to show that the Government were at fault in not doing as each individual thinks it should. The fact is, it is no more on the increase to-day than it was two years ago. There must necessarily be a number of new cases occurring from hereditary transmission, but the number is no greater than it was years ago, when less was said and written. There is no more danger of foreigners, who do not bring themselves into the most intimate possible contact with a leper, contracting the disease than that they should contract consumption from shaking hands with a person afflicted with that disease. The fact of a foreigner showing symptoms of the disease in the past has found sufficient grounds for the statement that "it was spreading rapidly," etc. I am aware that there are, and have been, foreigners who have for a greater or less time concealed the fact that they had the disease; but I am not aware that any of them have pretended to have always led here a "sober, upright, and righteous" life. This must be evident to the older residents here, as they have seen the disease almost

from its first discovery in these islands confine itself to those who have been at some time or other on the most intimate terms with the native population, who have been liable at all times to the disease. I have carefully investigated many of these cases, and in no single instance can I find that it was contracted by ordinary intercourse. I do not propose to make an invidious distinction in any case, but I do say that there is not the slightest possible cause for alarm on the part of either Hawaiian or foreigner who does not, or has not, held the most intimate possible relations with a leper.

As to the cause of the disease I am as much in the dark as those who have made it a special study for the past one hundred years. But I am sure that syphilis has nothing whatever to do with it, except as a complication. The strongest possible testimony can be adduced in support of this statement, both here and elsewhere, but I will cite cases in these islands that I think offer strong support to the statement. There are numbers of foreigners now residing here and who have been constant residents for the last forty years, who, almost on their arrival, contracted syphilis from native women, and passed through the different stages of that disease, and yet in no single instance, and I am familiar with several, have they as yet developed the slightest symptom of leprosy. Why should these people possess an immunity from leprosy if syphilis is either directly or indirectly the cause of it? But, says one physician, "we know nothing of the period of incubation." I will admit the statement, but at the same time I say there is little to fear from any disease that will not develop itself until twenty years after exposure. I am impressed with the idea that it develops much sooner in some than it does in others. Habit, mode of living, peculiarities of temperament, etc., play a prominent part, but I do not believe it takes twenty years in any case. So much has been said and written in the United States, in particular, in reference to the contagiousness and spread of the disease in these islands, that their interests have been affected by it, and some foreigners who would gladly visit here now believe that they would most surely return home to become lepers sooner or later. When there is such strong evidence obtainable from all parts of the world where the disease exists, against its contagiousness, I think this Government should take measures to spread such evidence broadcast over the land.

From the testimony of numerous navy surgeons who have visited Kakaako, there is no country in the world where leprosy exists, where those afflicted are so well cared for as they are here. This is undoubtedly a fact, as anyone who visits the Branch Hospital can see, and this Government can well be

proud of it. All its surroundings are as neat and orderly as any hospital can be, and one would hardly suppose, without investigation, that it was the abode of leprosy. There is very little evidence of suffering, and among the younger patients, could anyone see them at play, they would never suppose they were looking upon that hideous disease, leprosy. They all seem happy and contented, and it is but rarely that any complaint is heard.

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Your Excellency,

I have the honor to be

Your most obedient servant,

E. COOK WEBB, M. D.

Physician to Branch Hospital.

TABLE I.
THE BRANCH HOSPITAL, KAKAOKO, OAHU.

QUARTER ENDING.	1884.			1885.			1886.	1882-84.
	JUNE.	SEPT.	DEC.	MARCH.	JUNE.	SEPT.	MARCH.	TOTAL.
Patients admitted, males.....	24	13	7	12	7	8	2	333
Patients admitted, females.....	17	9	5	6	4	2	2	198
Patients died, males.....	4	4	3	3	1	1	4	25
Patients died, females.....	5	2	1	1			2	12
Patients born, males.....								
Patients born, females.....	1							
Patients sent to Molokai, males.....	13	11	8	26	2	22		1
Patients sent to Molokai, females.....	10	8	6	10		5		82
Patients discharged, males.....	4	4	12	11	4	2		39
Patients discharged, females.....	4	1	9	10	2	3	3	40
Patients returned, males.....	12	1			2	3	1	33
Patients returned, females.....	4				1	1		15
Patients at hospital, males.....	124	119	1		3			9
Patients at hospital, females.....	72	70	104	76	76	60	55	104
Patients under 12 years, males.....		16	60	45	50	44	45	55
Patients under 12 years, females.....		15	16	14	13	16		64
Patients from 12 to 45 years, males.....		93	14	12	13	12		29
Patients from 12 to 45 years, females.....		59	82	79	66	57		15
Patients over 45 years, males.....		27	46	41	32	29		211
Patients over 45 years, females.....		8	26	22	12	11		147
Patients over 45 years, females.....			12	11	8			93
								36

The patients included 2 Americans, 1 Irish, 1 German, 2 Portuguese, 6 Chinese, 2 South Sea Islanders, 2 Spaniards and 1 Pole.

TABLE II.

DEATHS AT THE BRANCH HOSPITAL—SEX, AGE AND CAUSE.

10

NAME.	SEX.	AGE.	IN HOSPITAL.	CAUSE OF DEATH.
Hamat.	Male	35	2 yrs 1 month	Peritonitis.
Habi.	Male	16	1 year 4 months	Heart disease.
Susan Pabaiwa.	Female	25	1 year 27 days	Exhaustion.
Kahohakahi.	Male	52	1 year 1 month	Leprosy.
Kaitieha.	Female	15	260 days	Consumption.
Kaimokh.	Female	17	6 months 20 days	Leprosy.
Akula.	Male	33	5 months 16 days	Exhaustion.
Makaiwa.	Female	39	3 days	Diarrhea.
Kenahu.	Female	43 days	43 days	Tuberculosis.
Kikua.	Female	25	3 years 7 months	Leprosy.
Mahiai.	Male	65	3 years 6 months	Pneumonia.
Milekioio.	Female	12	1 year 5 months	Leprosy, chronic pneumonia.
Kauaka.	Male	67	4 months 8 days	Hemiplegia apoplexy.
Kahohinui.	Male	53	2 months	Leprosy gangrene.
Kini.	Female	22	1 year	Exhaustion.
Kekui.	Male	25	11 months	Pyemia.
Keelana.	Male	38	11 months	Exhaustion.
Kapuni.	Male	31	1 year 2 months	Leprosy nephritis.
Kaholo.	Male	35	4 years 2 months	Consumption.
Pua.	Male	15	1 year 9 months	Exhaustion.
Halehuamakaoe.	Female	11	1 year	Exhaustion.
Joe Kukuma.	Male	24	10 months	Exhaustion.
Kaaukai.	Male	33	5 months	Leprosy phthisis.
Ekekele.	Female	11	2 years 10 months	Visceral leprosy.
Thomas Birch.	Male	50	2 years 4 months	Leprosy diarrhoea.
D. Quinn.	Male	64	5 months 9 days	Gangrene.
Mokuai.	Male	32	1 year 5 months	Exhaustion.
Weheholani.	Male	16	1 year	Phthisis pulmonalis.
Kalua.	Male	7	8 months	Tuberculosis.
Puileua.	Male	44	3 years 6 months	Leprosy exhaustion.
Kauzanui.	Female	22	2 years 1 month.	Phthisis pulmonalis.
Polly Tolman.	Female	50	3 years	Leprosy exhaustion.
Kaui.	Male	52	4 years	Pyemia.

Total number of deaths from April 1, 1884, to March 31, 1886, 33.

TABLE III.

MORTALITY OF CHILDREN OF LEPERS.

Out of 170 lepers recorded, at Kakaako, 93 of these had 385 children, of whom, at the date of the record (1883), 217 were dead and 168 living. The following table shows the results in the largest families.

Name.	Age.	Born.	Living.	Dead.
Kalia (m)	66	17	11	6
Kaaea (f)	40	15	7	8
Joane Paele (m)	40	13	3	10
Kauiia (m).	40	12	5	7
Kamahaluou (m)	43	12	3	9
Kalawahinui (f)	54	12	3	9
Kauwi (m).	36	11	7	4
Makahunalowa (m)	41	11	5	6
Kalakoa (m)	59	10	2	8
Oiliokalani (m)	60	10	5	5
Ulukou (m)	61	9	3	6
Kalua (f)	36	9	5	4
Kake (f)	46	9	8	1
Dan. Pale (m)	43	8	6	2
Kailipalua (f)	37	8	5	3
Sam. Kameahakau (m)	45	8	0	8
Nakiele (m)	53	7	0	7
Kauhaunaele (m)	34	7	2	5
Totals.		188	80	108

SUMMARY.

CAUSES OF DEATH.	Adult.		Children under 12.	
	Male.	Female.	Male.	Female.
Apoplexy	1	0	0	0
Consumption	1	2	0	0
Diarrhœa	1	0	0	1
Heart disease	1	0	0	0
Leprosy	3	1	1	0
Leprous gangre	1	0	0	1
Leprosy nephritis	1	0	0	0
Leprosy phthisis	1	0	0	0
Old age, exhaustion	5	3	0	1
Peritonitis	1	0	0	0
Phthisis pulmonalis	1	1	0	0
Pneumonia	1	0	0	1
Pyæmia	2	0	0	0
Visceral leprosy	0	0	0	1
Total	20	7	1	5

APPENDIX W.

REPORTS FROM DISTRICT PHYSICIANS ON LEPROSY IN THEIR DISTRICTS.

DR. J. H. KIMBALL, HILO DISTRICT, HAWAII.

Dr. Kimball reports 8 cases of leprosy and one suspect. One is a Prussian, and the remainder, Hawaiians; eight males and one female. They include a mother and her two children, and the nephew of a man who died from leprosy. The treatment adopted is Potass., Iodid., Sal. Soda. Fowler's Sol., alternate. Disease in abeyance.

The Prussian has been under treatment more than three years, and shows slight signs of improvement.

Dr. Kimball remarks that the disease is on the decrease in his district; that he has seen no cases in which opium has been known to have been used, and that alcoholic drinks have no perceptible effect on the disease.

He remarks that "owing to the fact that Hawaiians cannot be depended upon to follow directions for any considerable length of time, the treatment of them, in their homes, for any chronic disease is very unsatisfactory."

DR. RICHARD OLIVER, KAU DISTRICT, HAWAII.

Dr. Oliver reports one case of leprosy and three suspects in his district, all single, and Hawaiians, and without any leprous relatives. Three are females and one male. The treatment adopted is Arsenic and Iodide Potass.

Doctor Oliver remarks that the disease is stationary in his district, and that in former years he found that alcoholic drinks had a decidedly prejudicial effect on both forms of leprosy: of the effect of opium, he cannot speak.

DR. L. S. THOMPSON, DISTRICT OF KOHALA, HAWAII.

Dr. Thompson reports 11 lepers and 5 suspects. Seven married lepers have 15 children, 8 boys and 7 girls. There are 8

males and 8 females, and only 1, a suspect, is credited with a leprous relative, a brother. The treatment adopted is Fowler's solution of Arsenic, and Salicylic acid and Arsenic.

The disease is believed to be on the decrease in this district.

DR. BROOKES O. BAKER, DISTRICT OF NORTH AND SOUTH KONA,
HAWAII.

Dr. Baker reports 4 lepers, all natives, 2 males and 2 females, 2 married, with 3 children, and 2 single. The father of 1 of the married females was a leper.

The method of treatment adopted is to give as varied a diet as one can get, and liq. Pot. Arsen., Salicylic acid, Iron, Quinine, etc.

DR. R. KUEHN, DISTRICT OF LAHAINA, MAUI.

Dr. Kuehn reports 14 cases of leprosy, 10 males and 4 females, and all Hawaiians. Two are married, one a widower, and they have four children. Except in the cases of the two married ones, all have leprous relatives, father, son, brother, nephews and cousins.

Treatment; Potassium, Iodid, treatment, and Pot. Iodide and Hydrargyrum. Results not good.

DR. F. B. SUTLIFF, DISTRICT OF WAILUKU, MAUI.

Dr. Sutliff reports 17 lepers and 6 suspected lepers in his district, 11 males and 12 females, all Hawaiians, 7 married and 16 single. Five have relations who are lepers. Nine are under treatment by four different doctors. Dr. Sutliff states that in one case treated by him, Arsenic has seemed to arrest the disease somewhat. So far as he can judge the disease is on the decrease.

DR. CAMPBELL, DISTRICT OF HANAIEI, KAUAI.

Dr. Campbell reports thirteen lepers—8 males, 5 females—all Hawaiians; and ten married, with nineteen children from ten families. In three cases the father of the leper was a leper; in another, the son; and in another, the first husband and two children.

In regard to treatment, Dr. Campbell says:

"Constitutional: Tonics, especially nervine, I have found to answer best. Caution to live regularly, avoiding excesses of all

kinds. Potassium iodide does well in some cases, but in others it does no good.

Local: Iodoform ointment, 1-10. I have found best for the treatment of open sores. It is anti-septic, deodorizing, and slightly stimulating. I caution my patients to protect the anæsthetic parts of their limbs, as injuries unfelt by the patients are responsible for the sloughing of some parts. In some cases I have recommended the douche and shampooing as aids in maintaining the vitality of parts."

Dr. Campbell thinks that leprosy is stationary in the district, and that "the only way to cope with the disease is to segregate the affected part of the population, not because of the contagiousness of the disease, for that is a fact which has not been satisfactorily proved; but from the fact that the disease is admittedly hereditary; and by so segregating the leprous members of a community, prevent the procreation of bad stock, at least in healthy localities."

DR. ST. DAVID GYNLAIS WALTERS, LIHUE DISTRICT, KAUAI.

Dr. Walters reports two cases of leprosy and one suspect, all Hawaiians and males, and without leprous relatives. He considers "the condition of leprosy here as being in a most satisfactory condition," or, as stated in another section, "the condition of leprosy in the Lihue district must be regarded as very satisfactory." "I am perfectly satisfied, from my own experience, that it would be perfectly useless to attempt the treatment of native lepers at their own homes, because as soon as they are satisfied that they have acquired the disease they either hide themselves in remote corners of the woods, or place themselves under the care of kahunas, even though they profess to be following out the line of treatment laid down for them by the Government physicians."

DR. JOHN BORLAND, DISTRICT OF WAIMEA, KAUAI.

Dr. Borland reports seven lepers, all Hawaiians, and single—4 males and 3 females. Four of them acknowledge having leprous relatives. Six of them are under treatment with hydrophosphites, with iron and strychnine, and electricity or hydrophosphites with arsenic and electricity. A Chinaman, not under treatment, is reported as a suspected leper.

Dr. Borland thinks that leprosy is on the increase, and remarks: "I have encountered so many difficulties in dealing

with those affected, as owing to the prevailing opinion among the natives, that immediately on presenting themselves for treatment they will be sent off to Molokai. It is within my knowledge that this opinion exists extensively, thus preventing a number who would benefit by suitable treatment from seeking advice. This leads me to state that I am of opinion that the suggested hospital at Hanapihi would not only be desirable, but beneficial, as suitable treatment and close observation would be obtained; and, from the authority of the donors of the site, and from the suitability of the site, isolation satisfactory could be obtained."

DR. G. W. PARKER, WAIALUA DISTRICT, OAHU.

Dr. Parker reports three lepers—2 males and 1 female; and ten suspects—6 males and 4 females. Eight had thirty-five children. The mothers of two of the boy suspects had eleven; all dead except these boys; and another subject had ten, of whom eight are alive.

Dr. Parker states that he believes the disease is on the decrease. He says: "I only know of three or four really leprous persons in the whole district, even when all suspects were collected for this examination by the police. There are no Chinese lepers in the Waialua district. As a drug, opium has no specially beneficial effect on lepers. Alcoholic indulgence, as lowering the vital powers of the body, tends to hasten the fatal termination, besides causing its own complications."

Dr. Parker further remarks: "The above reported examination of real and supposed lepers was held on March 1st and 2nd; thirty-five persons were examined, including three really leprous, eight with suspicious symptoms, two with open syphilitic sores (needing hospital treatment), and several who were neither suspectable as lepers *in posse*, nor even visibly syphilitic. One woman (not herself showing leprous symptoms, but showing a conspicuous pinkish patch on one cheek) said that of her family, one brother and her stepmother had been sent to Molokai as lepers."

In regard to treatment, Dr. Parker says: "Of the few lepers who have come under my care in this district, none have been long enough (or diligent enough) under treatment for me to recommend any method as likely to succeed eventually in curing or retarding the disease here. But in Madagascar I found two methods which retarded the disease, viz:

A. Iodide of potassium in doses of 10 grains (gradually increased to 30 grains), two or three times a day, with tincture of perchloride of iron, in 10 drop doses, twice a day, taken after meals.

B. Gurgun oil and lime water, equal parts, administered both internally and externally; internally in 1-drachm doses, three times a day; externally rubbed all over the person, 5 or 6 times a day. Before such external application, the skin should be well rubbed with *dry sand* to remove all loose pieces of dead skin; and after each application soap and water may be used freely.

Method A is a practical test of the nature of a suspicious patch of skin, because local signs of improvement are soon evident under this treatment, if the disease is *not* leprosy. By either method the patient's health is greatly improved; while, by method B tubercles are gradually absorbed, and lost sensibility is recovered to a great extent. This is my own experience, and also the experience of physicians in charge of lepers at the Indian penal settlement of the Andaman Islands. For these islands I would advise a combination of these methods; thus, internally method A; externally method B (or salicylic acid, the application of which to leprous tubercles has been reported as causing them to be absorbed).

DR. S. E. CRADDOCK, WAIANAE DISTRICT, OAHU.

Dr. Craddock reports five lepers,—4 males, 1 female, and two male suspects, all Hawaiians. One married male (suspect) has four children and one male leper two children. Four of the cases have leprous relatives in a father, daughter, sister and brother.

The treatment adopted is galvanism, iodide of potassium and arsenic. The disease is said to be on the increase and has a tendency to progress more rapidly in alcohol drinkers.

Dr. Craddock says:

1. As long as lepers remain at large, it is almost impossible to treat them, as they hide and are screened by their relatives, in many cases with the connivance of the police. I would therefore recommend that a place be provided in each district where suspected cases could be kept three months say, under the supervision of the district physician before committal to Kakaako, or Molokai.

2. That the methods of treatment adopted by the physicians in charge of Kakaako be made known to the district physicians, and not enveloped in mystery as by Dr. Goto.

3. That such measures should be on a level with those of other countries, for which purpose communications should be exchanged periodically with other leper hospitals, *e.g.* in India and Europe.

4. That such remedies as Resorcin, Pyrogallin, Ichthyosulphate of Ammonium and Eucalyptol be tried, also nerve stretching and other recent methods.

5. That a periodical inspection should be made by the members of the Board of Health, in conjunction with two or more Physicians, not connected with the Leper Hospital.

6. That the police be directed to, in every way, assist the physicians in the detection of lepers.

DR. M. GOTO, BRANCH HOSPITAL, KAKAAKO.

BRANCH HOSPITAL, KAKAAKO,
HONOLULU, March 30th, 1886.

To His Excellency WALTER M. GIBSON,
President of the Board of Health.

SIR:—In reference to Your Excellency's request for information in regard to my method of treatment of the patients intrusted to my care at the branch hospital, I have the honor to report that;

In November last, Your Excellency permitted me to select ten (10) leprous cases at the Kakaako Hospital, to test my treatment upon. I have now no less than 39 cases, 13 males and 26 females, and I think I may claim to have obtained good results so far as improving the condition and appearance of the patients are concerned.

I only follow out a course of treatment that has been practised in my father's Hospital at Tokio, Japan, for many years, and one that has met with success among the Asiatic races from whom Hawaiians are supposed to be descended.

My treatment combines the hygienic, dietetic and medical,

First, as to the hygienic treatment: My patients are bathed in warm fresh water of the temperature of from 90° to 100° Fahrenheit. These baths are administered three times a day for the stronger patients, and twice a day for the weaker ones. Into this warm water is placed an infusion of a few ounces of Hichiyoubark for each person, together with certain proportions of Taifuushi and sulphur and other ingredients. The object of these baths is to promote not only cleanliness but free perspiration and an activity in the pores of the skin, giving a free circulation and a comforting feeling through purifying the system by getting rid of unhealthy secretions.

In this connection I would respectfully ask Your Excellency to induce the Board of Health to provide a resting room for the patients after their bath, as under present arrangements they are liable to catch cold in going to their rooms.

Secondly, as to the dietetic treatment, the object in giving strong nourishing food is to build up the debilitated system. I have adopted the regime of the Kihai Hospital at Tokio, or what is generally known as the Japanese Hospital for lepers. I feed the patients on rice, milk, beef, mutton, chicken, eggs, good strong broth, boiled taro, vegetables and fruit, but prohibit, as much as I possibly can, the use of sour poi, and also raw fish, when used with the usual native condiments. I feed the patients generously three times a day, but do not permit them to overeat.

As regards the medical treatment this naturally varies according to the condition of the patient, and the stage and character of the disease. The baths and the exterior applications create sensibility in the skin and in some of the anæsthetic cases, the comatose skin has been restored to sensibility and almost to the degree of original health, while tubercles have entirely disappeared. The two chief medicines that I use, in all cases, are Seiketsu-ren, as pills and in large doses, and Yoku-Yaku for baths. In the treatment of anæsthesia, tuberculosis, cutaneous inflammation, anæmia, neuralgia, diarrhœa and other intercurrent diseases accompanied by leprosy, I employ such other medicines for internal administration as tincture of chloride iron, sulphate of quinine, strychnine, iodide potass, vegetable tonics, gentian root, columbo, carbonate of soda and potassium. I find many of the alkaline salts especially adaptable for the disease in this country.

In concluding my report, I would respectfully say that the merits as to the efficacy or worthlessness of the system of treatment I am pursuing cannot be judged by the test of only four months; that I am giving satisfaction to the patients themselves is attested not only by the increase in number of those who voluntarily come to me at the Branch Hospital, but also in my private practice.

I have the honor to be,

Your most obedient servant,

MASANAO GOTO, M. D.

CASES UNDER TREATMENT.

Dr. Goto, under date of April 20th, 1886, reports that he has had under treatment at the Branch Hospital, Kakaako, 41 cases. Five of these cases, Nellie, Akeau, Oliva, Fisher (American) and Prosser, he reports as "almost cured," 19 as "improving," and 17 as "relieved."

Dr. Goto has received valuable written testimonials from some of his patients.